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Executive Compensation Tied to ESG Performance: International Evidence

Finance Working Paper N° 825/2022
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Abstract

Using a wide sample of international publicly traded firms, this paper studies the rapidly increasing practice of incorporating ESG metrics in executive compensation contracts. Our evidence suggests that this compensation practice varies at the country, industry, and firm level in ways that are consistent with efficient incentive contracting. We also observe that reliance on ESG metrics in executive compensation arrangements is associated with engagement, voting, and trading by institutional investors, which suggests that firms could be adopting this practice to align their management's objectives with the preferences of certain shareholder groups. Finally, we find that the adoption of ESG Pay is accompanied by improvements in key ESG outcomes, but not by improvements in financial performance.

Keywords: ESG metrics, Executive compensation, Institutional ownership

JEL Classifications: M12, M41, Q54

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ABSTRACT

Using a wide sample of international publicly traded firms, this paper studies the rapidly increasing practice of incorporating ESG metrics in executive compensation contracts. Our evidence suggests that this compensation practice varies at the country, industry, and firm level in ways that are consistent with efficient incentive contracting. We also observe that reliance on ESG metrics in executive compensation arrangements is associated with engagement, voting, and trading by institutional investors, which suggests that firms could be adopting this practice to align their management's objectives with the preferences of certain shareholder groups. Finally, we find that the adoption of ESG Pay is accompanied by improvements in key ESG outcomes, but not by improvements in financial performance.

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1. Introduction

The proportion of global firms indicating that their executive compensation schemes are tied to Environmental, Social, and Governance (ESG) metrics has grown rapidly in recent years (henceforth we refer to this practice as "ESG Pay"). According to the global ISS Executive Compensation Analytics database, which covers a wide cross-section of firms around the world, the share of firms designating ESG metrics as Key Performance Indicators (KPI) for their executives has grown from 3% in 2010 to over 30% in 2021.[1]

The primary goal of this study is to provide descriptive empirical evidence on the adopters and non-adopters of ESG pay around the world. We examine three potential reasons for companies to base executive compensation arrangements on ESG metrics. These rationales are interrelated and not mutually exclusive. The first reason relates to incentive contracting. To the extent that ESG metrics are viewed as leading indicators of future financial performance and potential risks, existing agency models provide an efficient contracting rationale for ESG Pay, even if the firm's shareholders preferences are purely pecuniary.

A second potential reason to adopt ESG Pay is aligning managerial objectives with the interests of select stakeholder groups, including the firm's shareholders. If the firm's current or prospective shareholders have an intrinsic preference for improvements in ESG related outcomes, the adoption of ESG Pay may serve as a mechanism for aligning the objectives of management with owners' preferences. For instance, asset managers could support the adoption of ESG metrics in the executive compensation schemes of their portfolio companies in order to attract or retain investment clients who may intrinsically value ESG outcomes.

[1] See Figure 1 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 grown to 38%.

Further, a distinctive feature of some "E" and "S" variables mentioned frequently in connection with ESG is that these variables reflect external costs (e.g., environmental pollution) that are not properly internalized by companies. By adopting ESG Pay, companies may therefore seek to appeal to certain external stakeholder groups, such as customers or creditors, in order to convey their intent to focus on outcome variables that these stakeholder groups intrinsically value.

A third potential rationale for ESG Pay is that the decision to tie managerial compensation to ESG outcomes may strengthen the credibility of a company's existing disclosures and pledges to improve its ESG outcomes, e.g., reduce its greenhouse gas emissions. Since such announcements are frequently met by concerns about "greenwashing", companies may seek to signal their commitment to focus on ESG related variables.

Our empirical tests are organized in three parts. First, we test for variation in ESG Pay at the industry, country, and firm level. Second, we examine whether ESG Pay adopters differ from other firms in terms of their institutional shareholders' engagement, voting, and trading activity. Third, we test whether there is a statistical association between the implementation of ESG Pay and changes in outcome variables, including carbon emissions, ESG ratings, and financial performance.

The data analyzed in this paper is 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.

The results of our tests suggest that each of the three rationales can explain part of the variation in ESG Pay adoption. Consistent with the notion of efficient incentive contracting, we

find that the adoption of ESG Pay correlates with variables that plausibly capture the costs and benefits of ESG variables for shareholders. At the industry/country level, we find that ESG Pay is more common in industries with a higher environmental footprint and in countries with heavier ESG regulations and greater social sensitivity towards sustainability. At the firm level, linking pay to ESG criteria is more common among larger firms and firms with relatively high levels of emissions. This is consistent with heavier emitters bearing a higher cost for carbon emissions and larger firms being subject to more public scrutiny about ESG performance. Consistent with the notion that current ESG outcomes are more likely to be recognized as leading indicators of future financial performance, we find that ESG adopters exhibit relatively high volatility. In contrast, our evidence is difficult to reconcile with the notion that ESG Pay facilitates rent extraction, as suggested by Bebchuk and Tallarita (2022). We find that ESG Pay is unrelated to abnormal CEO compensation and positively related to the percentage of independent directors.

Our results also support the argument that firms adopt ESG Pay to appeal to shareholders with intrinsic ESG preferences. We find that ESG Pay adopters exhibit a higher percentage of institutional ownership and a positive association with engagement, voting, and trading activities by these institutional investors. ESG Pay adoption is more likely after a firm is engaged by the "Big Three" (i.e., the three largest asset management companies). These adopting firms also receive higher voting support at director elections and compensation proposals and more favorable recommendations by proxy advisors. Finally, we observe that investors are more likely to increase their holdings in ESG Pay adopters.

We also provide evidence that the adoption of ESG Pay is accompanied by corporate pledges to ESG criteria. Specifically, ESG Pay is more common among firms with stated environmental pledges and higher ESG ratings. Our evidence also suggests that firms do not adopt

ESG Pay merely for "window-dressing" purposes. For instance, we find that when firms include emission-specific metrics in their executive compensation packages, they also achieve a subsequent decrease in their CO_2 emissions. Moreover, the adoption of ESG Pay is accompanied by relative improvements in ESG ratings.

Finally, our findings indicate that the adoption of ESG Pay is not positively associated with better financial performance. If anything, the results point in the opposite direction. One possible interpretation is that ESG Pay adoption may be more prevalent among firms with shareholders that have intrinsic ESG preferences. At the same time, superior ESG performance may yield long-term financial benefits for shareholders that are not yet captured in accounting earnings or/and stock prices.

In exploring two additional factors which may affect the adoption of ESG Pay, we find support in the data that the decision to adopt this practice is affected by individual perceptions, specifically personal opinions and expectations about ESG outcomes and/or ESG Pay, as well as peer effects. Specifically, a large part of the variation in ESG Pay appears to be idiosyncratic (the covariates and the fixed effect structure explain 30% of the variation). We also find that the adoption of ESG Pay is more prevalent in firms with a relatively large share of female directors. Finally, the probability of adopting ESG Pay increases with the fraction of industry peer firms adopting this practice, suggesting the presence of industry spillovers.

Our paper contributes to the literature by providing a large-sample, international analysis on potential reasons for the recent trend towards incorporating ESG metrics into compensation contracts. Previous studies have examined the link between executive compensation and CSR (a concept closely related to ESG), but the evidence there is restricted to the U.S., where the practice

of ESG Pay is less common.[2] Moreover, these studies are based on data on a relatively small cross-section of S&P100 or S&P500 firms prior to 2014, when ESG Pay was relatively uncommon (see Figure 1).

Typically, the questions addressed by these prior studies focus on whether basing compensation on CSR criteria is driven by agency costs (i.e., whether entrenched managers use CSR to advance personal interests). For example, Hong et al. (2016) and Ikram et al. (2019) find that contracting based on CSR criteria is more common among firms with relatively less powerful CEOs. Relatedly, Flammer et al. (2019) conclude that integrating CSR variables into executive compensation tends to improve firms' financial performance. Maas (2018) finds that setting quantitative, hard corporate social performance targets is an effective way to improve CSR results. In contrast to these papers, Bebchuk and Tallarita (2022) argue that a broader set of KPIs enables executives to extract additional rents from shareholders.[3] These authors also provide case evidence consistent with their hypothesis.

Our analysis of different rationales for the adoption of ESG Pay is particularly relevant considering the recent evidence that an increasing number of shareholders favor environmental and social criteria, even if they come at the expense of lower financial returns (e.g., Hartzmark and Sussman 2019). While descriptive, our finding that ESG Pay is associated with engagement, voting, and trading activities by institutional shareholders is also in line with the burgeoning literature on the role of these investors in the current efforts to meet environmental and social sustainability goals (e.g., Dimson et al. 2015; Azar et al. 2021).

[2] See Hong et al. (2016), Ikram et al. (2019), Flammer et al. (2019), Maas (2018), and Bebchuk and Tallarita (2022). A notable exception is a recent paper by Carter et al. (2023), which documents that the introduction of "Say on Pay" laws around the world is associated with an increase in ESG Pay and improvements in ESG performance.

[3] Also consistent with the notion that basing compensation on CSR criteria is driven by agency costs, prior literature in management argues that CSR can be used to add job security to inefficient managers, to compensate for the negative consequences of engaging in earnings management, and to enhance individual reputations of managers (e.g., Hong et al. 2016).

Our interpretation of the documented patterns is subject to several caveats. Our analysis is based on firms' public disclosure regarding their reliance on the use of ESG metrics in compensation contracts. For some companies in our sample, these disclosures are rather limited. Another issue is that, while our tests provide empirical support for the three economic rationales for the adoption of ESG Pay, there is no conclusive evidence as to which of these explanations is more prevalent in practice. A better understanding of the role of ESG metrics in executive compensation schemes is likely to emerge from more granular knowledge of the structure of the executive compensation contract implemented by a particular company. Specifically, it would be valuable for future research to have further access to the exact compensation vehicles, the relative weights attached to different performance metrics, and the use of discretionary bonus rules.

2. Conceptual framework

Our empirical tests are motivated by multiple potential explanations for why companies adopt ESG Pay. This section elaborates on three possible rationales for this practice. They should not be viewed as mutually exclusive, as multiple rationales may apply to any given firm.

(i) Incentive contracting (rationale 1)

In a traditional agency-theoretic framework, corporate owners care only about a company's financial performance, and not about broader societal measures such as those reflected in ESG variables. Current ESG outcomes may, however, be recognized as leading indicators of future financial performance. The rationale for ESG pay then is similar to that for the inclusion of non-financial variables, such as customer satisfaction or product quality, in managerial incentive contracts (Ittner et al. 1997; Dikolli, 2001; Sliwka, 2002; Dutta and Reichelstein, 2003).

In some contexts, ESG metrics may be viewed as indicators of future risk exposures, such as the risk of stranded assets due to climate change. This perspective is consistent with recent

evidence on the financial implications of risks associated with several ESG dimensions, e.g., climate risk or social unrest.[4] Here again, traditional agency models can demonstrate the contractual value of such leading risk indicators, even if the firm's share price is available for contracting purposes (Sliwka 2002; Paul 1992; Dutta and Reichelstein 2005).

In contrast to viewing ESG Pay as a tool for efficient incentive contracting, Bebchuk and Tallarita (2022) argue that this practice reflects the ability of entrenched executives to extract additional managerial rents. Specifically, the inclusion of ESG metrics in compensation contracts might be a way of disguising excessive managerial compensation, because subsequent ESG outcomes are difficult to measure and verify for outsiders. Such concerns are consistent with prior literature in management arguing that CSR initiatives can be appropriated by managers to advance their own personal interests (e.g., Hong et al. 2016).

We finally note that a traditional principal-agent framework can also provide a rationale for firms not to include ESG variables among their KPIs. If the so-called "signal-to-noise" ratio of these variables is too small, optimal incentive contracts would exclude these variables from the firm's KPIs (Lambert and Larcker 1987).

(ii) Stakeholder preference alignment (rationale 2)

In contrast to Friedman's (1970) classic advocacy for firms to maximize economic profits, Hart and Zingales (2017) have argued more recently that firms ought to maximize stakeholder welfare. The inclusion of ESG variables in executive compensation packages may be viewed as a step towards directing managers to balance the interests of multiple stakeholder groups.

The adoption of ESG Pay has the potential to partially align the objectives of a company's management with shareholders that intrinsically care about ESG outcomes in addition to financial

[4] 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).

outcomes (Pastor et al. 2020; Hart and Zingales 2017 and 2022; Bonham and Riggs-Cragun 2022). This possibility is supported by recent empirical research showing that some investor groups are willing to trade financial returns for improvements in ESG performance (Riedl and Smeet 2017; Barber et al. 2021; Krueger et al. 2020; Hartzmark and Sussman 2019; Ceccarelli et al. 2021). Institutional investors may therefore push for the adoption of ESG metrics in the executive compensation schemes of their portfolio companies, even if these institutional investors are agnostic or indifferent about ESG. By not doing so, the institutional investors would risk the loss of clients with an intrinsic ESG preference.

The adoption of ESG Pay could also seek to align managerial objectives with the interests of stakeholders other than the firm's owners. A distinctive characteristic of some ESG metrics, in particular those in the "E" and "S" categories, is that they reflect external costs arising from the firm's activities, yet these costs are not fully internalized by corporate decision makers focused on the firm's financial performance. Prime examples in this context are environmental pollution or the firm's labor conditions in other parts of the world. By incentivizing the firm's management to pay attention to these external effects, owners anticipate that other stakeholders, including creditors, consumers, and employees, may reward the firm financially in terms of bond purchases, or stronger customer and employee loyalty (e.g., Servaes and Tamayo, 2013; Lins et al., 2017; Krueger et al., 2020).

(iii) Signaling the importance of improved ESG outcomes (rationale 3)

The issue of external costs associated with some ESG variables has led companies to pledge improvements in their ESG scores. For instance, as part of their sustainability efforts more than 20% of the largest 2,000 global firms have recently articulated net zero emission pledges (Black et al. 2021). Accordingly, these firms have stated the goal to reduce their carbon emissions to zero

by 20xx, where frequently xx=50. While some of these firms have sought to substantiate their pledges by joining initiatives like the Science-Based Target initiative (SBTi), critics have argued that these pledges often lack credibility and amount to mere corporate greenwashing (Comello et al. 2021). Firms may therefore seek to strengthen the credibility of their voluntary pledges to improve ESG metrics by also linking their executives' pay to these metrics.[5]

It is possible that some firms seek to adopt ESG Pay only "nominally" in order to reap the benefits of being perceived as "ESG conscious" while avoiding costly ESG efforts. This is consistent with prior literature on CSR concerned about "window-dressing" or "greenwashing" (Delmas and Burbano 2011; Marquis et al. 2016; Grewal and Serafeim 2020). While such "window-dressing" is unlikely to persist as an equilibrium over multiple periods of time, it is arguably difficult to detect in the short run because outside observers generally do not have the requisite information regarding the relative weights given to different performance indicators, the use of targets and thresholds, as well as the exact form of a manager's payout function. We note that the possibility of pure "window-dressing" would render the adoption of ESG Pay a form of cheap talk (Melumad and Shibano 1991) rather than a costly signal.

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

[5] Having issued a net-zero emissions pledge, the cement manufacturer Heidelberg Materials (formerly Heidelberg Cement) announced in 2021 that the bonuses of top-level executives would be tied to the achievement of the company's emission reduction goals (Landaverde et. al, 2023).

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.[6] Our analysis ends in 2020, the last year with complete required data available at the time of our study (for a given year *t*, our tests require data on firm outcomes in year *t*+1).

Our analysis also incorporates separate data sources on greenhouse gas emissions, ESG ratings, and institutional ownership. 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, within MSCI and S&P indexes) and for prominent international organizations such as the United Nations Environment Program Finance Initiative (UNEP FI). Trucost collects carbon emissions data from publicly available sources, including the CDP. Other sources of carbon emissions data include companies' websites, annual reports (10-K), CSR reports, and direct communications with companies. 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).

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

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 the firm to be publicly traded and 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 recent evidence of a significant increase in the social sensitivity towards ESG in recent years (e.g., Azar et al. 2021). As shown in the table, a non-trivial number of firms have implemented ESG Pay toward 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. This is consistent with the notion that, by comparison, these countries are more ESG sensitive (Gibson et al. 2020). The table also shows that ESG Pay is less frequent in the U.S. than that in these other countries. Table 1, Panel D, presents the sample composition by industry. We find ESG Pay appears to be more prevalent in environmentally burdensome industries. Specifically, ESG metrics are most commonly used in the compensation contracts of producers of oil and petroleum products, utilities, and automakers.

3.2 Firm, industry, and country characteristics

Table 2 presents descriptive statistics of the variables used in our tests.[7] 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 incorporating ESG Pay are significantly larger, exhibit higher CO_2 emissions, have 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). We classify the metrics based on the three dimensions of the concept of ESG: environmental ("E"), social ("S"), and governance ("G"). Conceptually, the metrics classified as "G" are not completely separated from those classified as "E" or "S" and thus expand beyond the traditional view of corporate governance as a mechanism to mitigate agency frictions between managers and shareholders. For example, corporate culture and compliance often relate to wider aspects that often include issues related to stakeholders other than shareholders. Corporate culture is often associated with the working environment, or the purpose/mission of the organization. In turn, compliance is often associated with regulation related to firm externalities (for example, laws on human rights).

Our sample firms actively 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. Within the "S" dimension of ESG, Table 3 shows that firms often

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

use indicators related to safety, diversity and inclusion, and employee satisfaction/development. Finally, metrics pertaining to governance appear most frequently related 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). 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.[8]

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 "Decarbonization 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 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

[8] 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.

average weight is 13% in the short-term part of the contract and 16% in the long-term part of the contract.

4. Cross-sectional variation in ESG Pay

To gauge the empirical validity of the potential explanations for ESG Pay adoption described in section 2, we first explore the country, industry, and firm characteristics associated with this practice.

4.1 Research design

Based on the sample described in section 3, we estimate the following model (*i*, *k*, *c*, and *t* denote, respectively, firm, industry, country, and year):

$$ESG\ Pay_{it+1} = \alpha + \beta_1 * X_{ct} + \beta_2 * Y_{kt} + \beta_3 * Z_{it} + \tau_t + \gamma_c + \delta_k + \varepsilon_{it} \quad (1)$$

Our dependent variable is *ESG Pay*, an indicator variable that equals one if the company incorporates any ESG criterion in top executive compensation contracts in that year, and zero otherwise.[9] X_{ct} is a vector of country characteristics. Y_{kt} is a vector of industry characteristics. Z_{it} is a vector of firm characteristics. The variables τ_t, γ_c, δ_k refer to year-, country-, and industry-fixed effects, respectively.

To gauge whether the adoption of ESG Pay is driven by contracting considerations (rationale 1), we construct a set of variables aimed at capturing cross-sectional variation in the potential effect of ESG on shareholder value, including industry, country, and firm characteristics likely associated with the costs and benefits of ESG. At the industry and country level, we construct the following variables. *Industry with significant environmental footprint* is an indicator variable

[9] 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", as there is substantial overlap in the definitions of these three terms (Christensen et al. 2021). We also check manually the conformity of the names of the metrics with their classification by the data provider.

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 et al. 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).[10]

At the firm level, we include the following variables. *Log(CO_2)* is the natural logarithm of firm's direct (Scope 1) GHG emissions measured in metric tons of CO_2 equivalent. More polluting firms have a higher incentive to improve ESG performance (they face a higher cost for their emissions and could suffer from stranded assets). *Volatility* is the standard deviation of stock returns measured over the year (in percentage). When volatility is higher, current ESG outcomes are more likely to be recognized as leading indicators of future financial performance.

In addition, we include other variables pertaining to fundamentals and key financial characteristics related to the costs and benefits of ESG oriented management practices. *Size*, the logarithm of total assets, is included because larger firms face more public scrutiny about their ESG performance. *Log(BM)* is the logarithm of the book-to-market ratio (book value of equity divided by market value of equity). *ROA* is defined as net income scaled by total assets. *Return* is computed as the stock return over the year. We include these variables because financial performance and growth potential arguably affect firms' decisions about ESG-oriented management practices. Equation (1) also includes measures capturing variation in firms' financial policies, as these policies could affect the funding of ESG strategies. *Leverage* is computed as the sum of long-term debt and debt in current liabilities over the firm's total assets. *Tangibility* is the

[10] 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.

ratio of property, plant, and equipment over the firm's total assets (tangible assets are more easily collateralizable). Finally, *Dividends* is measured as total amount of dividends scaled by net income.

In light of our discussion in section 2, we introduce two additional variables that explore the possibility that the adoption of ESG Pay reflects rent extraction (i.e., inefficient contracting in the traditional agency-theoretic sense). *Abnormal compensation* is defined as the total compensation of the CEO minus the median CEO compensation among industry peers in the same size quintile. 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). This measure captures the notion that benchmarking of executive compensation is commonly based on size and industry affiliation and also avoids sample attrition (more sophisticated measures in the literature require data that is not readily available for all our international firms). As shown in Table OA.1 (online appendix) we obtain similar results using alternative measures of abnormal compensation. To capture variation in CEO power, we define *Pct independent* as the percentage of independent directors on the board.

The second group of variables relates to firm-level characteristics potentially associated with the likelihood that the firm adopts ESG Pay to cater to shareholders (rationale 2). *Institutional ownership* is the fraction of shares owned by institutional shareholders. Recent evidence suggests that institutional investors care about ESG performance because they believe that such performance may affect prices and/or can help them attract or retain clients that are sensitive towards climate risk (e.g., Krueger et al. 2020; Azar et al., 2021).[11] *Controlling shareholder* equals

[11] Some major investors have been quite vocal in pledging their commitment to ESG. A notable example is Larry Fink's 2021 annual letter to CEOs (https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter).

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 with ESG preferences.

To gauge whether firms adopt ESG Pay to convey their commitment to improved ESG outcomes (rationale 3), we include the following two variables in the analysis. *Emission pledge* equals one if the firm is a signatory of the Science-Based Target initiative (SBTi), and zero otherwise. *ESG rating* is the rating assigned to the company by Refinitiv. SBTi signatories and firms with higher ESG ratings likely have a higher need to strengthen the credibility of their voluntary pledges to improve ESG metrics. By signing to SBTi firms make a public commitment to reduce emissions. ESG ratings are based on firm policies and outcomes related to ESG, and thus is a proxy for firms' efforts to improve ESG performance. To a large extent ESG ratings are based on firms' public disclosures, which suggests that firms with higher ratings tend to make more public statements about their ESG actions.

Finally, we include two variables aimed at exploring whether the adoption of ESG Pay is associated with individual perceptions and/or peer effects.[12] *Pct female* is defined as the percentage of female directors in the board. Prior literature shows that female directors are more sensitive to ESG issues (Atif et al. 2021; Ginglinger and Raskopf 2021; Liu 2018) and is consistent with other research on the effect of women on CSR (e.g., Adams and Ferreira 2009; Cronqvist and Yu 2017). *Pct peer ESG Pay* is defined as 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).

[12] Individual perceptions could relate to opinions about ESG and its impact on valuation. Conditional on having a positive opinion on ESG, the willingness/reluctance to adopt ESG Pay could also be affected by idiosyncratic perceptions of this specific compensation practice. For example, some may think that ESG is a "must" and that paying a bonus for ESG would be akin to paying a bonus for behaving ethically. Others may opine that ESG Pay is not necessary because other already existing incentives (monetary or non-monetary) are enough to induce ESG effort.

4.2 Results

Table 4 presents the empirical characterization of ESG Pay based on the constructs defined above. Table 4, Panel A, presents the results of regressing *ESG Pay* on year, industry, country, industry-year, and country-year fixed effects. Table 4, Panel B, presents our findings on the firm-level characteristics of ESG Pay adopters. In the Online Appendix, Table OA.2 presents the results of repeating the analysis for each of the three dimensions of ESG (i.e., environmental, social, and governance). Table OA.3 and OA.4 show that the patterns are robust to restricting the sample of US firms to constituents of S&P 500 and to using a logit model, respectively. We structure the discussion of these results around the three rationales for ESG Pay adoption described in section 2.

4.3 Discussion

The evidence in Table 4 provides support for the notion that ESG Pay reflects efficient contracting (rationale 1), as the adoption of this practice seems to be shaped by costs and benefits of ESG and varies with some firm characteristics that justify the use of non-financial and leading indicators for contracting purposes. At the industry/country level, ESG Pay is more common in industries with a higher environmental footprint and in countries with heavier regulation on ESG and higher sensitivity towards ESG (i.e., in these countries, exhibiting lower ESG performance is more costly). At the firm level, linking pay to ESG criteria is more common among higher carbon emitters and among firms exhibiting greater volatility. For these firms, ESG metrics are more likely to be informative (i.e., leading indicators) about future performance. Table 4 also shows that ESG Pay adopters tend to be larger firms, which are more likely to be the target of ESG activism and/or regulatory pressure. The results in Table 4 do not lend support to the view that ESG Pay provides yet another tool for overcompensating executives. Notably, ESG Pay is not related to

abnormal levels of CEO compensation and is positively associated with the percentage of independent directors on the board, contrary to the notion that ESG Pay adopters have powerful CEOs.

In support of rationale 2 (stakeholder preference alignment), Table 4, Panel B, shows a positive association between ESG Pay and the percentage of institutional ownership (in Table OA.5 in the online appendix we corroborate this association using an instrumental variable for institutional ownership).[13] The results also indicate that ESG metrics are less common among firms with a controlling shareholder. This is consistent with the notion that dispersed ESG-sensitive shareholders hold a lower percentage of shares and therefore are less influential. These results provide support for the idea that shareholder demand for ESG plays a role in the decision to adopt ESG Pay. In support of rationale 3 (signaling commitment to improve ESG outcomes), Table 4 also provides evidence that firms implement ESG Pay to strengthen the credibility of their ESG-related objectives. Table 4, Panel B, column (2) and (6) reveal that firms with environmental pledges and higher ESG ratings are more likely to base compensation contracts on ESG criteria.[14]

The results in Table 4 also suggest that the adoption of ESG Pay is affected by factors other than the three considered rationales. Panel A in Table 4 shows that 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*. The

[13] 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 OA.4 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).

[14] 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.

inclusion of firm characteristics increases the explanatory power, but a substantial part of the variation in *ESG Pay* relates to idiosyncratic factors, which could include individual perceptions on ESG and/or on ESG Pay. Of course, a relatively low R^2 could also result from measurement error in the proxies for our economic rationales.

Table 4 shows that linking pay to ESG metrics is more common among firms with more female directors. This result is in line 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). Consistent with the notion that peer firms' practices affect firms' decisions to implement ESG Pay, we find an empirical association between the inclusion of ESG metrics and the percentage of industry peers that implement this practice.

5. ESG Pay and institutional shareholders

We next explore whether the adoption of ESG Pay is associated with engagement, voting, and trading by institutional shareholders. This analysis can speak to the potential explanations for ESG Pay adoption described in section 2, as recent research suggests that institutional investors believe that ESG performance affects prices and/or can attract (or retain) clients with intrinsic ESG preferences (e.g., Krueger et al. 2020; Azar et al., 2021). While descriptive, the results of this analysis can also shed light on the ongoing debate on the role of these investors in the transition towards a more sustainable economy (e.g., Bebchuk and Hirst 2019; Azar et al. 2021).

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"). We hand collect engagement information from recent investment stewardship reports (ISRs) published by these investors. 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.

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* in *t+1* on *Engagement by at least one Big Three* in *t*. 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. 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).

5.2. Shareholder voting

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

$$Voting\_Support_{it+1} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma * Controls_{it} + \tau_t + \gamma_c + \delta_k + \varepsilon_{it} \quad (2)$$

where $Voting\_Support_{it+1}$ is the average fraction of support votes casted for each of the two categories of voting items (i.e., director elections and compensation-related proposals) at the annual meeting of firm *i* following the end of the fiscal 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).[15] We measure voting at *t*+1 because corporate information on executive compensation is released after the year end.

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 investors. 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 the firm's institutional investor ownership. Focusing on investment funds, we estimate the following model at the firm-fund-year level:

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

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. Similar to the previous test, we measure changes in holdings at *t*+1 because corporate information on executive compensation is released after year end.

[15] In robustness tests we include as additional controls the governance variables defined in section 4. Our inferences are unaffected.

5.4. Results

The results in Tables 5-7 show that ESG Pay is associated with shareholder engagement, voting support, and an increase in institutional holdings. Table 5 indicates that the inclusion of ESG metrics in compensation contracts is more frequent among firms recently engaged by the Big Three (as shown in Table OA.6, this result is robust to including firm fixed effects). Table 6, columns (1) and (2), shows a positive association between ESG Pay and voting support, for both director elections and compensation-related proposals. In Table OA.7, 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. 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. Finally, the results in Table 7 suggest that investment funds are more likely to increase their stake in firms that implement ESG Pay (see Tables OA.8 and OA.9 for robustness to additional controls and alternative measurement choices).

Tables 6 and 7 (see also Table OA.10 for engagements) present results replacing ESG Pay with indicator variables for the types of ESG metrics according to the taxonomy in Table 3. In general, the results show that the metrics associated with the environmental dimension drive a substantial part of the association. However, the coefficients on most of those variables are not statistically significant. One possible reason is the relatively high correlation among these variables (see Table OA.11 in the online appendix). This correlation is probably generated by the fact that firms use several types of ESG metrics (the ESG categories in which these indicator variables are based are not mutually exclusive). A similar consideration applies to the results from the tests in section 6, in which we also include indicators for the types of ESG metrics.

5.5. Discussion

Finding that ESG Pay is associated with shareholder engagement, voting support, and increases in institutional holdings can be interpreted as institutional investors favoring this practice because they believe it will result in higher returns and/or lower risk. Under this perspective, the evidence is consistent with ESG Pay reflecting efficient incentive contracting (rationale 1) and strengthening the firm's pledges to pay attention to ESG-related performance (rationale 3). The evidence in Tables 5-7 can also be interpreted as institutional investors pushing for ESG Pay on behalf of shareholders that have intrinsic preferences for ESG beyond risk-return considerations (rationale 2). The notion that institutional investors play a role in the implementation of ESG Pay is also supported by Carter et al. (2023), who document that the introduction of "Say on Pay" laws around the world is associated with an increase in ESG Pay.

6. Outcomes associated with ESG Pay

This section explores whether there is a statistical association between the decision to adopt ESG Pay and changes in three outcome variables: CO2 emissions, ESG ratings, and financial performance. To the extent that finding an empirical link between compensation arrangements and firm outcomes can be interpreted as descriptive evidence on the purpose of incentive schemes, this analysis can shed further light on the motivation for ESG Pay adoption described in section 2.

6.1. Carbon emissions

We start by testing whether ESG Pay is associated with reductions in the firm's carbon emissions. To this end, we estimate the following model:

$$\Delta\, CO2_{it} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma\, * Controls_{it-1} + \tau_t + \delta_i + \varepsilon_{it} \qquad (4)$$

where $\Delta\, CO2$ is the change in the firm's carbon dioxide emissions, measured in metric tons of CO_2 with respect to the previous year (i.e., from t-1 to t). We focus on a firm's direct (Scope 1)

emissions because these are emitted by the firm itself rather than parties along the firm's supply chain.[16] *ESG Pay* and *Controls* are as previously defined (see equation 2 and Appendix A for variable definitions). 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, Corporate culture, Compliance, Governance,* and *Other.* As before, sub-indexes *i* and *t* refer to firm *i* and year *t*, respectively. τ_t and δ_i denote year and firm-fixed effects, respectively. Including firm fixed effects ensures that we capture the time-series association between firm-specific changes in ESG pay and firm-specific changes in ESG performance (as shown in Table OA.12 in the online appendix, our inferences also hold when we exclude firm fixed effects and include annual changes in the independent variables).

6.2. ESG ratings

Next, we repeat the previous test replacing the dependent variable in equation (4), *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 (beyond having a smaller coverage of our sample firms, KLD ratings are only readily available until 2018). In Table OA.13 of the Online Appendix, 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. In general, there is a positive and significant association.

[16] The GHG Protocol proposes a breakdown of the total amount of GHG emissions into three scopes based on the source of emissions. "Scope 1" emissions relate to direct GHG emissions from production facilities that are owned or controlled by the company.

6.3. 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 (4), Δ *CO2*, with Δ *ROA* and *Return*. Δ *ROA* is 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). *Return* is the stock return of the firm compounded over the year.

6.4. Results

The results in Tables 8-10 show that ESG Pay is associated with better ESG performance, but not with better financial performance. Table 8 (Column (1)) shows that, while the coefficient on *ESG Pay* is not statistically significant, when we focus on emission-specific components of ESG Pay (Column (2)), the coefficient on *Carbon emissions* is negative and significant, which is consistent with the notion that introducing emission-specific metrics in top executive compensation contracts induces emissions reduction (see section OA.14 of the online appendix for an analysis of the potential confounding effect of the "G" dimension of ESG metrics). 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. Also, recalling our finding above that ESG disclosure mandates tend to make the adoption of ESG pay more likely, the results obtained for equation (4) are consistent with earlier findings that firms located in countries with mandatory carbon reporting exhibit incrementally lower carbon emissions (Downar et al. 2021).

Table 9 shows that, when using Δ *ESG rating* as the dependent variable (Columns (1), (3), and (5)), the coefficient on *ESG Pay* is positive and significant (for two of the three ratings used), suggesting that ESG Pay is associated with 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. 2022).

Finally, in Table 10 we do not find a positive relationship between ESG Pay and changes in accounting profitability, at least in the short term (Columns (1) and (2)). When we distinguish between the various categories of ESG metrics, we find some negative relation with the use of carbon-specific metrics. Table 10, Columns (3) and (4), reveals a negative and marginally significant association between ESG Pay and stock returns, which appears to be driven by carbon specific KPIs.

Table OA.15 in the online appendix repeats the analyses in Tables 8 and 9 by splitting the sample by geographic area. We find that the results are somewhat more pronounced in Europe, which is consistent with the notion that European countries are more sensitive towards ESG issues. Specifically, European countries exhibit higher values of *Country ESG sensitivity* and *ESG disclosure mandate*, measures used to capture regulatory and social pressure to improve ESG performance.

6.5. Discussion

Overall, Tables 8 and 9 are generally consistent with the notion that ESG Pay reflects optimal contracting (rationale 1); ESG Pay practice appears to be associated with ESG performance improvement. However, the evidence in Table 10 that ESG Pay is not associated with improvements in financial performance is difficult to reconcile with rationale 1 (i.e., incentive contracting). Taken at face value, the evidence presented seems to support the idea that ESG Pay is driven by pressure from shareholders with intrinsic ESG preferences, i.e., shareholders that are willing to accept lower returns to improve ESG (rationale 2). Furthermore, while the findings in Table 10 could on its own be interpreted as consistent with window-dressing, such interpretation

is not easy to reconcile with the findings in Tables 8 and 9. Rather, the results from Tables 8 and 9 seem more consistent with the notion that ESG Pay strengthens a firm's pledge to improve ESG performance (rationale 3).

Nonetheless, several caveats are in order. First, the results in Tables 8-10 are not statistically strong. Second, lower financial performance in the short term (Table 10) does not necessarily imply a destruction of shareholder value, as superior ESG performance could yield long-term benefits for shareholders not yet captured by current accounting earnings and/or by stock prices. Third, the interpretation of Table 9 depends on one's priors on the quality of ESG ratings as measures of ESG performance. Recent empirical evidence casts doubt on the quality of the currently prevalent ESG ratings (Berg et al. 2022).

7. Additional analyses

To complement our exploratory analysis looking at the potential reasons underlying the adoption of ESG Pay, we conduct three additional tests. We first analyze whether ESG Pay is associated with the use of ESG-based debt instruments. This analysis can shed light on the explanations for ESG Pay adoption described in section 2, as it relates to firms' financing choices and to firms' interactions with debtholders (i.e., an important type of stakeholder different from shareholders). Finally, we also conduct two tests aimed at providing a more complete characterization of the compensation contracts including ESG criteria; we analyze the pay sensitivity to ESG performance and the relative weight of ESG metrics.

7.1. ESG Pay and creditors

We analyze whether ESG Pay adopters are more likely to issue ESG-based debt instruments. We examine four types of these 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 that depend on specific ESG conditions.[17] We obtain data on these debt instruments from Bloomberg and Refinitiv DealScan (see Kölbel and Lambillon (2022) and Kim et al. (2022) for a detailed description of this data). We estimate the following model:

$$\textit{ESG debt instrument}_{it+1} = \alpha + \beta_1 * \textit{ESG Pay}_{it} + \gamma * \textit{Controls}_{it} + \tau_t + \delta_i + \varepsilon_{it} \quad (5)$$

ESG debt instrument is one of the following four variables: *Green loan,* an indicator for whether the company takes a green loan in that year; *ESG-linked loan,* an indicator variable for whether the company takes an ESG-linked loan in that year;[18] *Green bonds*, an indicator variable for whether the company issues green bonds in that year; *ESG-linked bonds,* an indicator variable for whether the company issues an ESG-linked bond in that year.[19] *ESG Pay* and *Controls* are as previously defined (equation 2). Table 11 provides evidence that ESG Pay is associated with the use of green bonds, ESG-linked loans, and ESG-linked bonds. This suggests that ESG Pay could be playing a role in debt contracting, which is in line with the notion that ESG Pay is a way to align managerial objectives with the interests of stakeholders other than the firm's equity owners (rationale 2).

[17] For a more detailed description of the features of ESG debt instruments see Kim et al. (2022), Carrizosa and Ghosh (2022), Amiram et al. (2021), Choy et al. (2021), and Flammer (2021).

[18] Following prior research (e.g., Kim et al. (2022), Carrizosa and Ghosh (2022)), we classify a loan as ESG-linked if its interest spread is contractually tied to ESG performance. We code as "ESG-linked" the loans classified as "Environmental, social & Governance/Sustainable Linked" by Dealscan (variable *Market_Segment*). This approach is different from Amiram et al. (2021) and Choy et al. (2021), who focus on environmental-related covenants.

[19] Following Kölbel and Lambillon (2022) we code an issue of corporate bonds as ESG-linked if it is classified as "Sustainability Linked Bond" by Bloomberg's fixed income database. Typically, these bonds integrate at least one Sustainability Performance Target (SPT). If a company meets the SPT by a specified date, then the coupon payment is adjusted.

7.2. Pay for ESG performance

Table OA.16 in the Online Appendix tests the time-series association between cash compensation (defined as the logarithm of the sum of annual salary and cash bonus) and ESG outcomes (i.e., carbon emissions and ESG ratings). We find some evidence of "pay for ESG performance" in firms with ESG Pay; specifically, cash compensation is negatively (positively) associated with emissions (ESG ratings). In contrast, no such association exists for firms that do not adopt ESG Pay. While the results in Table OA.16 are consistent with the notion that ESG Pay provides incentives to increase ESG performance (and thus is in line with efficient incentive contracting), 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).[20] This finding may reflect a relatively low signal-to-noise ratio in the ESG metrics (Lambert and Larcker, 1987). Of course, it is also possible that the small sensitivity of pay to ESG performance in our tests is partially driven by the limitations of our data; our right-hand side variables are proxies for ESG performance, and the available data covers a timespan of only ten years.

7.3. Relative weight of ESG metrics

In Table OA.17 of 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.17). One possible interpretation of these patterns is that ESG metrics are gradually substituting for other non-financial metrics at firms that were initially reluctant to implement ESG Pay. Such

[20] We obtain similar but insignificant results when we regress changes in compensation on changes in ESG performance.

interpretation would be consistent with the presence of shareholder pressure (rationale 2). Yet, we acknowledge that this test is subject to sample attrition, as data on the weights of performance measures in compensation contracts is not always publicly available for our sample firms.

8. 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 examines several potential explanations for the adoption of ESG Pay. We explore the empirical validity of three major rationales for ESG Pay: (i) efficient incentive contracting, (ii) stakeholder preference alignment, and (iii) strengthening the credibility of ESG pledges.

Our tests first consider the variation in ESG Pay at the industry, country, and firm level. We then explore whether ESG Pay adopters differ from other firms in terms of institutional shareholders' engagement, voting, and trading activities. Finally, we explore the statistical association between the implementation of ESG Pay and changes in key outcome variables: CO_2 emissions, ESG ratings, and financial performance.

Overall, the results suggest that each of the three rationales can explain part of the variation in ESG Pay adoption. Consistent with ESG Pay reflecting efficient contracting, we find that the adoption of this practice varies with metrics plausibly associated with the costs and benefits of ESG outcomes as well as with firm characteristics that favor the use of non-financial and leading indicators in compensation contracts. Consistent with shareholder demand for ESG playing a role in ESG Pay adoption, we find that ESG Pay is associated with institutional ownership, as well as with engagement, voting, and trading activities by these institutional investors. Finally, consistent with the use of this practice to convey a firm's commitment to ESG, we find that firms making ESG-related pledges are more likely to adopt ESG Pay. The alternative possibility that ESG Pay

is adopted for "window-dressing" purposes is not supported by the data, as ESG Pay appears to be significantly associated with changes in key ESG outcomes.

Our interpretation of the documented patterns is subject to several caveats. The evidence presented is mainly descriptive and based on firms' public disclosure on the use of ESG metrics in compensation contracts, which in some cases is relatively limited. In addition, the interpretation of the previous patterns depends on one's priors on the informativeness of the metrics we use in our tests, particularly on the quality of ESG ratings. All this calls for further research into the determinants and potential consequences of the recent increase in ESG Pay around the world.

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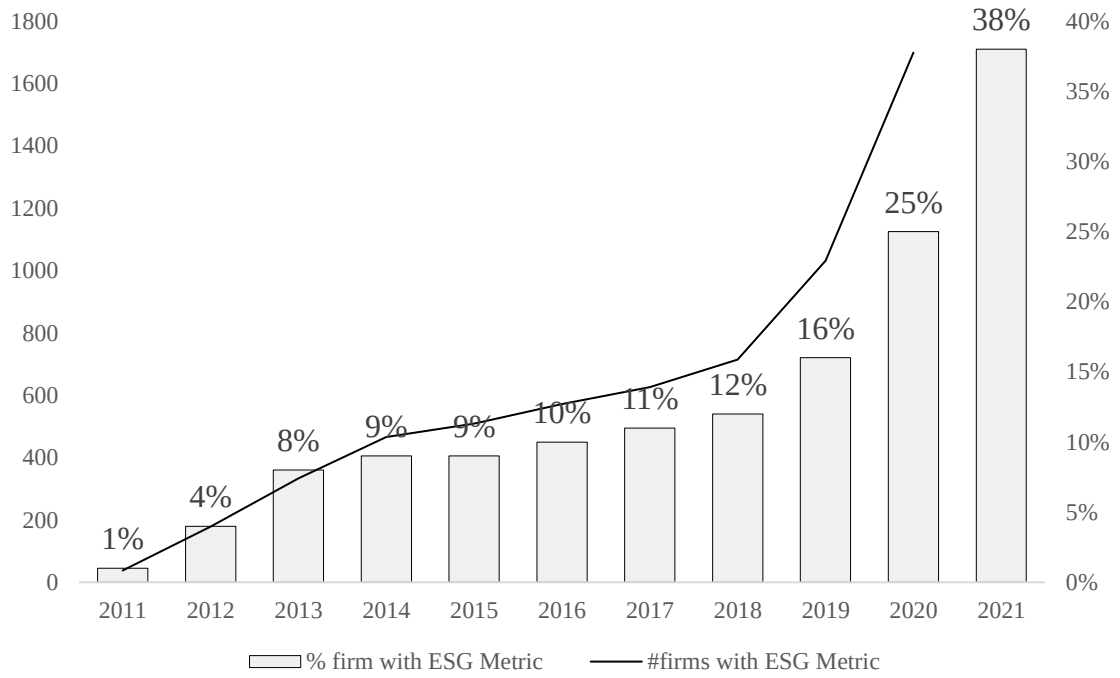
Figure 1. Use of ESG Metrics in Executive Compensation

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 represents 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 top 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.
Return	Stock return of the firm compounded over the year (expressed as a fraction of the past market value)
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
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
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 the following industries: 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 rating for the company. Values range from 0 to 1. A higher score indicates better ESG Performance.
ESG rating (Sustainalytics)	Sustainalytics' ESG rating for the company. Values range from 0 to 100. A higher score indicates better ESG Performance.
ESG rating (KLD)	Score obtained from MSCI's KLD database 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.
Corporate culture	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to corporate mission, culture, and ethics, and zero otherwise.
Compliance	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to compliance with various financial (SOX 404(b)) and non-financial regulations such as laws on human rights, anti-corruption, animal welfare, and zero otherwise.
Governance	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to governance, 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 CEO compensation among industry peers in the same size quintile (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.
Voting support (Director election)	Percentage of favorable votes in director elections, averaged across directors.
Voting support (Compensation-related proposals)	Percentage of favorable votes in compensation-related proposals.
ISS recommendation (Director election)	Fraction of directors for whom ISS recommends voting in favor.

ISS recommendation (Compensation-related proposals)	Indicator variable that equals one if ISS recommends voting in favor of the compensation-related proposal, and zero otherwise.
ESG-linked loan	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.
Green loan	Indicator variable that equals one if in that year the company takes a loan dedicated to finance a particular environmentally friendly project, and zero otherwise.
ESG-linked bonds	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.
Green bonds	Indicator variable that equals one if in that year the company issues bonds dedicated to finance a particular environmentally friendly project, 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)
Corporate culture	Colleague Culture & Engagement survey	Lloyds Banking Group Plc (2020)
Compliance	FY2021 actions and targets (continue to assess human rights, bribery and corruption and other related risks)	Sandfire Resources Ltd (2021)
Governance	Establish standalone corporate governance and risk procedures at the company following internalization that build trust, create long-term securityholder value and align with company values	Waypoint REIT Ltd (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

			# firms by type of ESG metric								
Year	# obs.	# firms with ESG Pay	Carbon emissions	Other environmental	Safety and security	Diversity and inclusion	Employee satisfaction	Corporate culture	Compliance	Governance	Other
2011	887	21	1	17	12	0	10	5	3	1	0
2012	1,281	72	2	33	52	4	20	16	10	12	3
2013	1,411	140	4	71	98	8	49	37	20	13	6
2014	1,625	189	5	101	139	10	58	42	22	32	13
2015	1,805	233	8	115	172	12	81	53	28	30	13
2016	1,859	276	11	126	196	21	95	51	31	39	17
2017	3,107	407	19	187	279	34	134	82	54	59	34
2018	3,244	489	29	223	302	39	180	102	55	85	43
2019	3,549	715	65	325	396	69	322	184	84	171	53
2020	3,835	1,198	155	504	611	212	616	394	173	309	79

Table 1. Sample Composition by Year, Country, and Industry (cont'ed)

Panel C. Sample distribution by country

				# firms by type of ESG metric								
Country	# obs.	# firms	# firms with ESG Pay	Carbon emissions	Other environmental	Safety and security	Diversity and inclusion	Employee satisfaction	Corporate culture	Compliance	Governance	Other
Australia	1,675	337	184	9	90	142	36	126	87	52	101	0
Austria	150	33	19	8	8	4	5	7	8	3	5	2
Belgium	152	25	16	2	8	4	1	10	6	2	1	2
Canada	1,716	319	168	9	118	146	15	98	79	41	99	3
Denmark	159	37	8	1	2	1	1	4	2	2	1	1
Finland	216	45	10	3	2	7	1	3	1	0	0	0
France	1,195	192	114	27	46	44	29	66	34	12	13	28
Germany	907	167	100	20	56	15	16	48	43	12	36	16
Great Britain	2,65	390	172	27	62	69	33	105	72	30	50	33
Greece	35	16	8	0	4	3	1	1	2	1	1	1
Ireland	72	15	3	1	3	1	0	1	1	0	1	0
Italy	423	84	51	12	34	12	9	17	20	4	9	9
Netherlands	381	57	35	5	24	12	3	22	10	4	2	4
New Zealand	68	19	6	1	2	5	1	3	1	0	2	0
Norway	192	49	14	1	9	6	0	12	7	2	4	2
Portugal	76	15	10	2	5	2	0	2	2	1	2	3
South Africa	77	69	39	4	18	22	12	22	16	12	15	2
Spain	288	48	24	8	17	10	8	10	12	5	9	5
Sweden	598	132	22	3	13	6	1	5	6	2	7	1
Switzerland	398	103	32	3	13	12	5	26	13	9	9	1
U.S.	11,175	2,243	370	26	118	221	73	183	97	65	30	48

Panel D. Sample distribution by industry

				# firms by type of ESG metric								
Industry	# obs.	# firms	# firms with ESG Pay	Carbon emissions	Other environmental	Safety and security	Diversity and inclusion	Employee satisfaction	Corporate culture	Compliance	Governance	Other
Agriculture	103	26	0	1	2	0	2	3	0	1	0	0
Food Products	425	80	2	12	9	4	11	7	0	4	1	2
Candy & Soda	107	19	1	3	2	1	5	2	1	1	0	1
Beer & Liquor	138	22	0	1	0	1	1	1	1	2	1	0
Tobacco Products	34	4	0	0	0	1	1	0	0	0	0	0
Recreation	92	24	0	1	0	0	0	1	0	1	0	0

Entertainment	220	45	1	3	5	3	7	4	4	6	2	1
Printing and Publishing	205	33	1	1	2	1	6	3	0	1	0	1
Consumer Goods	348	56	4	6	3	3	9	2	1	0	2	4
Apparel	169	32	1	6	0	3	2	1	1	1	1	1
Healthcare	257	57	0	3	9	1	15	4	5	5	2	0
Medical Equipment	566	122	1	1	2	0	7	2	0	2	3	1
Pharmaceutical Products	944	232	1	18	12	8	38	24	15	10	3	1
Chemicals	564	91	9	29	37	7	14	8	5	9	2	9
Rubber and Plastic Products	126	28	2	4	4	0	4	5	2	2	2	2
Textiles	39	7	1	2	1	0	1	1	1	1	0	1
Construction Materials	536	104	9	15	20	4	14	13	2	12	2	9
Construction	685	124	7	21	42	8	25	14	10	14	8	7
Steel Works Etc	328	55	6	9	18	3	11	8	4	3	2	6
Fabricated Products	23	8	1	0	1	0	0	0	0	1	0	1
Machinery	798	139	6	18	20	7	19	13	5	8	4	6
Electrical Equipment	185	36	0	5	6	0	4	3	0	3	1	0
Automobiles and Trucks	497	86	4	12	8	6	10	10	4	3	4	4
Aircraft	198	30	1	6	5	5	5	5	1	2	3	1
Shipbuilding, Railroad Equipment	46	8	0	2	2	0	1	1	1	0	0	0
Defense	32	7	0	0	1	0	1	0	0	1	0	0
Precious Metals	403	84	2	62	73	8	35	47	18	44	1	2
Non-Metallic & Industrial Metal Mining	382	76	10	38	54	7	34	28	13	26	0	10
Coal	70	17	0	9	10	0	2	1	3	2	1	0
Petroleum and Natural Gas	949	164	27	92	110	11	55	48	26	47	3	27
Utilities	985	148	19	73	87	25	63	41	24	22	17	19
Communication	595	106	7	16	8	11	23	16	7	11	10	7
Personal Services	252	51	0	2	6	0	11	5	3	3	0	0
Business Services	2,347	530	5	31	35	20	65	25	10	21	18	5
Computers	407	83	2	3	1	4	11	2	0	2	6	2
Electronic Equipment	941	189	3	8	7	10	19	12	2	4	6	3
Measuring and Control Equipment	314	59	0	0	2	2	1	0	1	0	1	0
Business Supplies	230	44	3	7	13	2	4	1	0	5	1	3
Shipping Containers	103	18	2	1	6	0	2	1	0	3	0	2
Transportation	794	148	9	20	39	6	29	12	10	17	10	9
Wholesale	676	130	4	8	24	9	18	11	5	13	4	4
Retail	1,261	225	2	19	18	8	35	13	8	15	10	2
Restaurants, Hotels, Motels	397	78	1	5	7	3	8	6	2	1	5	1
Banking	1,773	380	6	31	15	27	58	46	28	27	8	6
Insurance	820	143	3	19	6	12	35	27	11	14	5	3
Real Estate	384	88	4	14	5	4	13	16	5	12	3	4
Trading	749	143	3	12	3	13	32	25	17	14	8	3
Other	106	16	2	3	4	2	5	1	3	1	1	2

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
ESG Pay	22,603	0.37	0	0	0.17	0
Log(CO2)	22,603	2.97	8.32	10.19	10.23	12.04
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
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
Institutional ownership	22,603	0.31	0.26	0.52	0.54	0.84
Controlling shareholder	22,603	0.31	0	0	0.11	0
Pct independent	19,882	20.32	61.54	77.78	71.82	87.50
Abnormal Compensation	20,258	0.43	-0.12	0	0.08	0.19
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
ESG disclosure mandate	22,603	0.45	0	0	0.28	1
Country ESG sensitivity	22,603	7.94	69.30	71.19	74.14	80
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
Carbon emissions	22,603	0.11	0	0	0.01	0
Other environmental variables	22,603	0.26	0	0	0.08	0
Safety and security	22,603	0.30	0	0	0.10	0
Diversity and inclusion	22,603	0.13	0	0	0.02	0
Employee satisfaction and development	22,603	0.25	0	0	0.07	0
Corporate culture	22,603	0.20	0	0	0.04	0
Compliance	22,603	0.14	0	0	0.02	0
Governance	22,603	0.18	0	0	0.03	0
Engagement by at least one Big Three	17,399	0.33	0	0	0.13	0
Engagement by BlackRock	7,384	0.39	0	0	0.19	0
Engagement by StateStreet	17,399	0.24	0	0	0.06	0
Engagement by Vanguard	3,835	0.31	0	0	0.11	0
Voting support (Director elections)	14,037	21.13	93.93	97.16	90.77	98.54
Voting support (Compensation proposals)	13,359	16.25	89.83	95.24	89.57	97.57
ISS recommendation (Director elections)	14,213	0.23	1	1	0.91	1
ISS recommendation (Compensation proposals)	13,535	0.33	1	1	0.86	1
ESG-linked loan	22,313	0.11	0	0	0.01	0
Green loan	22,313	0.04	0	0	0.002	0
ESG-linked bonds	22,313	0.05	0	0	0.002	0
Green bonds	22,313	0.11	0	0	0.01	0

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

Panel B. Partitioning by ESG Pay

	ESG Pay = 1		*ESG Pay* = 0		Difference in means
Variable	Mean	Median	Mean	Median	(p-value)
Log(CO2)	11.95	11.80	9.89	9.92	2.05***
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***
Emission pledge	0.03	0	0.01	0	0.02***
ESG rating (Refinitiv)	0.73	0.84	0.59	0.64	0.14***
Institutional ownership	0.48	0.42	0.55	0.54	-0.07***
Controlling shareholder	0.10	0	0.11	0	0.003
Pct independent	72.71	77.78	71.63	77.78	1.08***
Abnormal compensation	0.03	0	0.09	0	0.06***
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***
ESG disclosure mandate	0.41	0	0.26	0	0.15***
Country ESG sensitivity	75.13	74.90	73.94	71.19	1.20***
ESG rating (Sustainalytics)	64.14	63.55	58.79	57.65	5.34***
ESG rating (KLD)	2.46	2	1.83	1	0.63***
Engagement by at least one Big Three	0.22	0	0.10	0	0.12***
Engagement by BlackRock	0.25	0	0.16	0	0.09***
Engagement by StateStreet	0.11	0	0.05	0	0.06***
Engagement by Vanguard	0.13	0	0.09	0	0.04***
Voting support (Director elections)	93.67	97.59	90.23	97.08	3.44***
Voting support (Compensation proposals)	89.34	95.04	89.62	95.28	-0.28
ISS recommendation (Director elections)	0.95	1	0.91	1	0.04***
ISS recommendation (Compensation proposals)	0.88	1	0.86	1	0.02**
ESG-linked loan	0.03	0	0.01	0	0.03***
Green loan	0.004	0	0.001	0	0.003***
ESG-linked bonds	0.01	0	0.001	0	0.01***
Green bonds	0.03	0	0.01	0	0.03***

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)	
Environmental ("E"):	
Carbon emissions	172
Other environmental variables	652
Social ("S"):	
Safety and security	744
Diversity and inclusion	250
Employee satisfaction and development	771
Governance ("G"):	
Corporate culture	519
Compliance	259
Governance	397
Other	161
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. Cross-sectional Variation in ESG Pay

This table reports estimates from the analysis of determinants of use of ESG metrics in executives' compensation contracts. The dependent variable, *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 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 country-industry 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 footprint						0.265***	
						(4.12)	
ESG disclosure mandate						0.098***	0.065***
						(4.74)	(4.13)
Country ESG sensitivity						0.008***	0.002**
						(4.63)	(2.25)
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)	(6)
Log(CO2)	0.013***					0.013***
	(4.04)					(3.65)
Volatility	0.001**					0.001**
	(2.05)					(2.31)
Size	0.029***					0.016***
	(7.54)					(3.25)
Log(BM)	0.004					0.007
	(0.74)					(1.10)
ROA	-0.064**					-0.080**
	(-2.52)					(-2.45)
Returns	0.004					0.008
	(0.72)					(1.34)
Leverage	-0.057**					-0.039
	(-2.25)					(-1.37)
Tangibility	0.122***					0.139***
	(4.04)					(4.00)
Dividends	0.017***					0.020***
	(3.12)					(3.36)
Emission pledge		0.143***				0.116***
		(3.64)				(3.02)
ESG rating (Refinitiv)		0.184***				0.057**
		(9.03)				(2.58)
Institutional ownership			0.140***			0.051**
			(6.02)			(1.97)
Controlling shareholder			-0.045***			-0.033*
			(-3.18)			(-1.87)

Pct independent				0.002***		0.001***
				(6.80)		(3.23)
Abnormal compensation				0.035***		-0.004
				(3.97)		(-0.49)
Pct female					0.003***	0.001***
					(7.40)	(3.27)
Pct peer ESG Pay					0.016***	0.012***
					(8.34)	(4.93)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
R^2	0.28	0.27	0.25	0.27	0.27	0.30
# Obs.	22,603	19,829	22,603	17,983	19,885	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 an indicator variable that equals one if BlackRock, State Street, or Vanguard engage with the firm, and zero otherwise. *Engagement by BlackRock* is an 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 an 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***			
	(4.52)			
Engagement by BlackRock		0.03***		
		(2.63)		
Engagement by StateStreet			0.05***	
			(3.10)	
Engagement by Vanguard				0.01
				(0.66)
Size	0.04***	0.05***	0.04***	0.06***
	(14.12)	(14.86)	(14.56)	(14.54)
Log(BM)	0.01	0.01	0.01	0.01
	(1.32)	(1.10)	(1.19)	(0.61)
ROA	-0.10***	-0.15***	-0.10***	-0.18***
	(-4.56)	(-5.41)	(-4.59)	(-4.40)
Return	0.01	0.01	0.00	-0.03**
	(0.94)	(0.87)	(0.89)	(-2.46)
Leverage	-0.05**	-0.04	-0.05**	-0.05
	(-2.12)	(-1.24)	(-2.15)	(-1.39)
Tangibility	0.15***	0.14***	0.15***	0.14***
	(5.13)	(3.95)	(5.15)	(3.55)
Dividends	0.02***	0.02***	0.02***	0.03***
	(3.19)	(2.65)	(3.19)	(2.71)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
R^2	0.29	0.34	0.29	0.34
# Obs.	17,399	7,384	17,399	3,835

Table 6. Shareholder Voting

This table reports estimates from the analysis of the association of ESG pay and shareholder voting. In Panel A, in columns (1) – (2) *Voting support* is the average percentage of favourable votes in the election of directors; in columns (3) – (4) *ISS recommendation* is the fraction of directors for whom ISS recommends voting in favor. In Panel B, in column (1) – (2) *Voting support* is the percentage of favourable votes in compensation-related proposals; in columns (3) – (4) *ISS recommendation* is one if ISS recommends voting in favor of the compensation proposal, and zero otherwise. *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. Columns (2) and (4) of each panels includes indicator variables for each of the types of metrics included in Table 3. 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.

Panel A. Director elections

Dep. Variable:	*Voting support*		*ISS recommendation*	
Indep. Var.:	(1)	(2)	(3)	(4)
ESG Pay	1.297***		0.053***	
	(3.13)		(7.37)	
Carbon emissions		1.602		0.069***
		(1.38)		(4.49)
Other environmental variables		1.226*		0.021**
		(1.92)		(2.52)
Safety and security		0.677		0.023**
		(1.28)		(2.51)
Diversity and inclusion		-0.465		0.014
		(-0.67)		(1.15)
Employee satisfaction and development		0.154		0.030***
		(0.29)		(3.61)
Corporate culture		-0.473		-0.008
		(-0.68)		(-0.79)
Compliance		0.956*		0.005
		(1.69)		(0.52)
Governance		0.194		0.019**
		(0.27)		(2.14)
Other		1.077		0.038*
		(0.77)		(1.74)
Controls	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R^2	0.72	0.72	0.14	0.14
# Obs.	14,037	14,037	14,212	14,212

Table 6. Shareholder Voting (cont'ed)

Panel B. Compensation-related proposals

Dep. Variable:	*Voting support*		*ISS recommendation*	
Indep. Var.:	(1)	(2)	(3)	(4)
ESG Pay	0.608		0.042***	
	(1.15)		(4.03)	
Carbon emissions		2.540**		0.066**
		(2.27)		(2.47)
Other environmental variables		1.922**		0.034**
		(2.46)		(2.11)
Safety and security		0.281		-0.001
		(0.39)		(-0.05)
Diversity and inclusion		-0.540		0.013
		(-0.59)		(0.58)
Employee satisfaction and development		0.450		0.034**
		(0.59)		(2.54)
Corporate culture		-0.592		0.005
		(-0.68)		(0.27)
Compliance		0.024		-0.040*
		(0.02)		(-1.78)
Governance		-1.216		0.013
		(-1.18)		(0.70)
Other		0.389		0.026
		(0.29)		(0.89)
Controls	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R^2	0.20	0.20	0.10	0.11
# Obs.	13,359	13,359	13,535	13,535

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 an 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 each of the types of metrics included in Table 3. 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 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:	Δ *Fund ownership*	
	(1)	(2)
ESG Pay	0.029***	
	(2.63)	
Carbon emissions		0.024
		(1.14)
Other environmental variables		-0.029
		(-1.49)
Safety and security		0.015
		(0.94)
Diversity and inclusion		0.012
		(0.81)
Employee satisfaction and development		0.024
		(1.40)
Corporate culture		-0.022
		(-0.70)
Compliance		-0.012
		(-1.01)
Governance		0.012
		(0.60)
Other		0.124
		(1.46)
Size	0.021	0.021
	(1.31)	(1.31)
Log(BM)	-0.032***	-0.032***
	(-3.77)	(-3.77)
ROA	0.182***	0.176***
	(3.38)	(3.25)
Return	0.010	0.010
	(0.53)	(0.51)
Leverage	-0.174*	-0.174*
	(-1.87)	(-1.88)
Tangibility	-0.102*	-0.096
	(-1.69)	(-1.60)
Dividends	-0.004	-0.004
	(-1.28)	(-1.40)
Firm FE	YES	YES
Fund-Year FE	YES	YES
R^2	0.29	0.29
# Obs.	9,304,167	9,304,167

Table 8. GHG emissions

This table reports estimates from the analysis of the association between ESG pay and ESG performance. 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). *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. In column (2) *ESG Pay* is replaced with indicator variables for each of the types of metrics included in Table 3. The rest of the variables are defined in Appendix A. The control 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 CO2	
	(1)	(2)
ESG Pay	-0.07	
	(-0.85)	
Carbon emissions		-0.77***
		(-2.88)
Other environmental variables		-0.11
		(-1.02)
Safety and security		-0.05
		(-0.34)
Diversity and inclusion		-0.04
		(-0.15)
Employee satisfaction and development		0.14
		(0.91)
Corporate culture		0.06
		(0.56)
Compliance		-0.11
		(-0.78)
Governance		-0.06
		(-0.46)
Other		0.02
		(0.16)
Size	-0.09	-0.10
	(-1.46)	(-1.61)
Log(BM)	-0.02	-0.02
	(-0.54)	(-0.46)
ROA	0.18*	0.18*
	(1.86)	(1.90)
Returns	0.00	0.01
	(0.16)	(0.21)
Leverage	0.27	0.28
	(1.54)	(1.60)
Tangibility	0.57	0.57
	(1.60)	(1.60)
Dividends	0.00	0.00
	(0.11)	(0.07)
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.15	0.15
# Obs.	21,715	21,715

Table 9. ESG Ratings

This table reports estimates from the analysis of the association between ESG pay and ESG performance. 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 an 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), (4), and (6) *ESG Pay* is replaced with indicator variables for each of the types of metrics included in Table 3. The rest of the variables are defined in Appendix A. The control 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 *ESG rating (Refinitiv)*		Δ *ESG rating (Sustainalytics)*		Δ *ESG rating (KLD)*	
	(1)	(2)	(3)	(4)	(5)	(6)
ESG Pay	-0.001		0.233*		1.004**	
	(-0.17)		(1.95)		(2.42)	
Carbon emissions		0.001		-0.583**		6.660***
		(0.07)		(-2.12)		(10.82)
Other environmental variables		-0.000		-0.105		-0.244
		(-0.10)		(-0.59)		(-0.24)
Safety and security		-0.002		0.242		0.075
		(-0.34)		(1.26)		(0.13)
Diversity and inclusion		0.021***		0.045		3.877***
		(3.08)		(0.17)		(3.18)
Employee satisfaction and development		-0.002		0.260		0.704
		(-0.48)		(1.49)		(0.92)
Corporate culture		0.001		0.169		1.417
		(0.15)		(0.80)		(1.23)
Compliance		-0.000		-0.057		1.505*
		(-0.08)		(-0.21)		(1.87)
Governance		-0.003		-0.354		0.795
		(-0.43)		(-1.59)		(0.54)
Other		0.005		0.566*		0.922
		(0.46)		(1.87)		(1.17)
Size	0.004	0.004	0.393***	0.369***	0.917	1.063
	(1.15)	(1.16)	(3.17)	(2.96)	(1.35)	(1.58)
Log(BM)	-0.010***	-0.010***	0.041	0.050	-0.133	-0.148
	(-4.03)	(-4.01)	(0.43)	(0.52)	(-0.37)	(-0.42)
ROA	-0.113***	-0.113***	0.221	0.237	-2.801	-2.846
	(-7.58)	(-7.58)	(0.55)	(0.59)	(-1.13)	(-1.14)
Returns	-0.000	-0.000	-0.187**	-0.184**	0.085	0.095
	(-0.18)	(-0.20)	(-2.48)	(-2.45)	(0.31)	(0.35)
Leverage	0.010	0.010	-0.424	-0.383	-1.920	-1.578
	(0.72)	(0.70)	(-0.99)	(-0.89)	(-1.03)	(-0.86)
Tangibility	-0.035*	-0.034	-0.505	-0.479	4.647	5.402

	(-1.69)	(-1.64)	(-0.79)	(-0.74)	(1.37)	(1.61)
Dividends	-0.010***	-0.010***	0.054	0.051	0.089	0.053
	(-5.73)	(-5.77)	(0.98)	(0.93)	(0.54)	(0.32)
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	0.24
# Obs.	19,252	19,252	17,148	17,148	1,351	1,351

Table 10. 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 an 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 each of the types of metrics included in Table 3. The rest of the variables are defined in Appendix A. The control 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		-0.015*		-0.079***
		(-1.89)		(-2.66)
Other environmental variables		-0.001		0.007
		(-0.37)		(0.35)
Safety and security		-0.008		-0.027
		(-1.46)		(-0.94)
Diversity and inclusion		0.002		-0.002
		(0.38)		(-0.07)
Employee satisfaction and development		0.004		0.024
		(0.93)		(0.98)
Corporate culture		0.001		-0.083***
		(0.11)		(-3.11)
Compliance		0.004		-0.015
		(0.55)		(-0.36)
Governance		0.010		0.014
		(1.43)		(0.50)
Other		-0.010		-0.053
		(-1.13)		(-1.62)
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

Table 11. ESG debt instruments

This table reports estimates from the analysis of the association between ESG pay and the use of ESG debt instruments. *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. *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, and zero otherwise. *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. *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. In Panel A, *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. In Panel B, *ESG Pay* is replaced with indicator variables for each of the types of metrics included 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. Firms with and without ESG metrics

	Dep. Var.: *ESG-linked loan*		Dep. Var.: *Green loan*		Dep. Var.: *ESG-linked bonds*		Dep. Var.: *Green bonds*	
Indep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG Pay	0.014***	0.013***	-0.000	-0.001	0.003**	0.007***	0.012***	0.017***
	(4.07)	(2.87)	(-0.32)	(-0.76)	(2.11)	(2.60)	(2.83)	(3.76)
Size	0.004***	-0.005	0.001***	-0.002**	0.001***	-0.003*	0.008***	-0.010***
	(7.20)	(-1.58)	(2.80)	(-2.36)	(3.02)	(-1.66)	(8.57)	(-3.40)
Log(BM)	-0.002**	-0.003	-0.000	-0.001	0.000	-0.001	-0.000	-0.004
	(-2.27)	(-1.29)	(-0.91)	(-0.90)	(0.12)	(-1.18)	(-0.02)	(-1.61)
ROA	-0.005	0.006	-0.002*	0.002	0.001	0.004	-0.010***	0.013***
	(-1.45)	(0.94)	(-1.95)	(1.51)	(0.60)	(1.28)	(-2.99)	(2.81)
Leverage	0.001	0.010	-0.001	-0.004	0.005**	0.009	-0.011**	-0.046***
	(0.28)	(0.86)	(-0.73)	(-1.38)	(2.26)	(1.40)	(-2.06)	(-3.98)
Tangibility	0.009	-0.002	0.005	0.001	-0.005**	-0.024**	0.023***	-0.018
	(1.50)	(-0.09)	(1.51)	(0.22)	(-2.28)	(-2.01)	(2.64)	(-1.33)
Dividends	-0.000	-0.001	-0.000	0.000	0.000	-0.000	-0.002	0.000
	(-0.32)	(-0.41)	(-0.82)	(0.20)	(0.12)	(-0.02)	(-1.32)	(0.35)
Returns	-0.001	-0.002	0.001	0.000	-0.001**	-0.001**	0.002	-0.003**
	(-1.55)	(-1.33)	(1.46)	(0.45)	(-2.14)	(-2.17)	(1.38)	(-1.97)
Industry FE	YES	n.a	YES	n.a	YES	n.a	YES	n.a
Country FE	YES	n.a	YES	n.a	YES	n.a	YES	n.a
Firm FE	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.04	0.22	0.02	0.21	0.02	0.21	0.08	0.35
# Obs.	22,313	21,735	22,313	21,735	22,313	21,735	22,313	21,735

Table 11. ESG Debt Instruments (cont'ed)

Panel B. Breakdown by type of ESG metric

	Dep. Var.: *ESG-linked loan*		Dep. Var.: *Green loan*		Dep. Var.: *ESG-linked bonds*		Dep. Var.: *Green bonds*	
Indep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Carbon emissions	0.061***	0.061***	0.022	0.021*	0.012	0.017	0.018	0.020
	(3.09)	(2.78)	(1.61)	(1.85)	(1.41)	(1.55)	(0.89)	(1.12)
Other environmental variables	0.006	0.010	-0.003	-0.002	-0.001	-0.003	0.034***	0.038***
	(1.00)	(1.14)	(-1.14)	(-0.51)	(-0.28)	(-0.63)	(4.64)	(3.95)
Safety and security	0.002	0.007	-0.001	0.002	0.003	0.009*	-0.025***	-0.020***
	(0.35)	(0.87)	(-0.22)	(1.20)	(1.06)	(1.89)	(-4.03)	(-2.88)
Diversity and inclusion	0.008	0.015	0.000	0.002	-0.001	0.000	0.019	0.011
	(0.71)	(1.09)	(0.06)	(0.44)	(-0.15)	(0.02)	(1.32)	(0.78)
Employee satisfaction and development	0.005	-0.003	-0.001	-0.002	0.000	-0.001	0.001	0.004
	(0.66)	(-0.42)	(-0.83)	(-0.81)	(0.13)	(-0.18)	(0.14)	(0.54)
Corporate culture	-0.006	0.002	-0.003	-0.003	-0.003	-0.002	-0.006	-0.005
	(-0.89)	(0.27)	(-1.29)	(-1.02)	(-0.87)	(-0.59)	(-0.70)	(-0.54)
Compliance	0.004	-0.001	0.003	-0.000	0.001	0.003	0.014	0.007
	(0.42)	(-0.06)	(0.49)	(-0.00)	(0.17)	(0.50)	(0.99)	(0.56)
Governance	0.007	-0.011	0.005	0.000	0.004	0.003	0.010	0.000
	(0.75)	(-1.07)	(1.16)	(0.02)	(0.87)	(0.53)	(0.95)	(0.03)
Other	-0.001	0.004	-0.001	-0.002	0.003	0.003	0.010	0.006
	(-0.07)	(0.28)	(-0.18)	(-0.98)	(0.49)	(0.40)	(0.63)	(0.44)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	n.a	YES	n.a	YES	n.a	YES	n.a
Country FE	YES	n.a	YES	n.a	YES	n.a	YES	n.a
Firm FE	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
R^2	0.05	0.22	0.02	0.21	0.02	0.21	0.08	0.35
# Obs.	22,313	21,735	22,313	21,735	22,313	21,735	22,313	21,735

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