

Executive Compensation Tied to ESG Performance: International Evidence

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ABSTRACT

Using a wide sample of international publicly traded firms, this paper studies the rapidly increasing practice of relying on 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.

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. Our analysis explores which firm characteristics, e.g., country location or industry affiliation, are associated with the adoption of ESG Pay. We also examine to what extent certain outcome variables, such as ESG performance and financial performance, differ across firms that rely on ESG metrics as their KPIs, and those that do not.

The discussion of our findings is structured around three potential reasons for companies to base their executive compensation arrangements on ESG metrics. The first one relates to incentive contracting. Provided these metrics are viewed as leading indicators of future financial performance and potential risks, earlier 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 certain shareholders and other stakeholders. 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’

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%.

preferences.² 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.

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 that base managerial performance evaluation entirely on financial results. Companies may therefore seek to appeal to certain external stakeholder groups, such as customers or creditors, by adopting ESG Pay in order to convey that management will henceforth have incentives to pay attention to outcome variables that these stakeholder groups intrinsically value.

A third and related 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 “green washing”, companies may seek to signal their commitment to focus on ESG related variables.

The data analysis 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.

² Recent work by Bebchuk and Tallarita (2022) has argued that ESG Pay does not serve the purpose of efficient incentive contracting. To the contrary, these authors argue that this practice may exacerbate agency problems with respect to executive pay. Specifically, their concern is that the disclosure of contractual details related to the use of ESG metrics is frequently insufficient, and that subsequent ESG outcomes are difficult to assess by external parties.

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.

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 oriented management. Further, ESG Pay correlates with firm characteristics that suggest the use of non-financial and leading indicators for contracting purposes. 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 higher social sensitivity towards sustainability. At the firm level, linking pay to ESG criteria is more common among firms exhibiting greater levels of emissions, higher volatility, and larger size. In contrast, our evidence is difficult to reconcile with the notion that ESG Pay facilitates rent extraction, as suggested by Bebchuk and Tallarita (2022). ESG Pay is unrelated to abnormal CEO compensation and positively related to the percentage of independent directors.

Our results 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 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 provide evidence that the adoption of ESG Pay is accompanied by corporate pledges to pay attention to ESG criteria. Specifically, ESG Pay is more common among firms with stated environmental pledges and higher ESG ratings. The evidence does not support the notion that ESG Pay is merely adopted 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 CO₂ emissions. Moreover, the adoption of ESG Pay is accompanied by relative improvements in ESG ratings.

Our findings indicate that the adoption of ESG Pay is not positively associated with higher financial performance. If anything, the results point in the opposite direction. One possible interpretation of this result is that ESG Pay adoption relates to firms with shareholders that have intrinsic non-pecuniary ESG preferences. However, superior ESG performance might yield long-term benefits for shareholders that are not yet captured in accounting earnings or/and by stock prices.

Finally, 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 and peer effects. Specifically, a large part of the variation in ESG Pay appears to be idiosyncratic (the covariates and the fixed effect structure explain barely 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.³ Moreover, these studies are based on data on a relatively small cross-section of firms (S&P100 or S&P500) during the period 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).⁴ 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 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. These authors also provide case evidence consistent with their concern.

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,

³ See Hong et al. (2016), Ikram et al. (2019), Flammer et al. (2019), Maas (2018), and Bebchuk and Tallarita (2022).

⁴ Consistent with this possibility, 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).

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).

Our interpretation of the documented patterns is subject to several caveats. The evidence presented here is mainly descriptive, which cautions against making strong causal claims. Further, 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. While this section elaborates on three potential rationales for this practice, we emphasize that multiple rationales may apply to any given firm. Thus, they should not be viewed as mutually exclusive.

(i) Incentive contracting (rationale 1)

In a traditional agency-theoretic framework, corporate owners care only about a company's financial performance, but not about broader societal measures such as those reflected in ESG

variables. The rationale for ESG pay in such a framework is similar to that for the inclusion of non-financial variables (e.g., customer satisfaction or product quality) in managerial incentive contracts.⁵

In some contexts, ESG metrics may be viewed as leading 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 dimensions of ESG (e.g., climate risk, social unrest).⁶ Here again, earlier agency models have demonstrated the contractual value of such leading 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 also provides a rationale for firms not to include any ESG variables among their KPIs. If the so-called "signal-to-noise" ratios of these variables is too small, optimal incentive contracts would exclude these variables from the firm's KPIs (Lambert and Larcker, 1987).

⁵ See, for instance, Ittner et al. (1997), Dikolli (2001), Sliwka (2002), and Dutta and Reichelstein (2003).

⁶ 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).

(ii) Stakeholder preference alignment (rationale 2)

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 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 Smeets 2017; Barber et al. 2021; Krueger et al. 2020).⁷ 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).

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

⁷ For further evidence on investors' preferences towards ESG see also Hartzmark and Sussman (2019) and Ceccarelli, Ramelli, and Wagner (2021).

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.

(iii) Signaling commitment to improve 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.⁸

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.⁹ 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 make the adoption of ESG Pay an instrument of cheap talk (Melumad and Shibano, 1991) rather than a costly signal.

⁸ 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, 2022).

⁹ This is consistent with prior literature on CSR, which has long been concerned about the possibility of “window-dressing” or “greenwashing” (Delmas and Burbano 2011; Marquis et al. 2016; Grewal and Serafeim 2021).

3. Data, sample, and descriptive statistics

3.1. Data and sample

Our main sample includes international public firms covered by ISS Executive Compensation Analytics (ECA) from 2011 to 2020. ECA provides detailed, comparable data on incentive awards, including performance metrics, performance goals and payout structures on all incentive awards for over 9,000 companies across the U.S., Canada, U.K., Europe, Australia, New Zealand, and South Africa. Although the ECA database starts in 2008, comprehensive coverage of performance metrics used in compensation contracts is only available from 2011.¹⁰ Our analysis ends in 2020, the last year with complete data available at the time of our study.

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.¹¹ 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

¹⁰ Unfortunately, the data on performance goals and payout structures is not available for many firms covered by the ECA database.

¹¹ Other sources of carbon emissions data include companies' websites, annual reports (10-K), CSR reports, and direct communications with companies.

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).

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. ESG metrics are most commonly used in the compensation contracts of producers of oil and petroleum products, utilities, and automakers. ESG Pay appears to be more prevalent in environmentally burdensome industries.

3.2 Firm, industry, and country characteristics

Table 2 presents descriptive statistics of the variables used in our tests.¹² Panel A presents the summary data for the pooled sample and Panel B distinguishes between observations with and without ESG Pay. Table 2, Panel B, shows that firms with ESG Pay are significantly larger, exhibit higher CO₂ emissions, higher ESG ratings, and are more likely to make environmental pledges.

3.3 Contract characteristics

Table 3 presents summary data on the characteristics of compensation contracts containing ESG metrics. Panel A presents a taxonomy of the ESG metrics we observe (see Table 3 for the number of sample firms using each type of metric and Appendix B for examples of each type). 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. In the “S” dimension of ESG, Table 3 also indicates that firms often use indicators related to safety, diversity and inclusion, and employee satisfaction/development. 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). Clearly, the categories listed in Table 3, Panel A, are not mutually exclusive; a substantial number of

¹² Continuous variables are winsorized at the top and bottom 1%.

executive compensation contracts include more than two metrics, presumably to capture the multidimensional nature of ESG performance.¹³

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 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.

¹³ 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.

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.¹⁴ 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 , δ_k , γ_c refer to year-, industry-, and country-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 for companies from transportation, utilities, steel, and oil & petroleum products. *ESG Disclosure Mandate* is defined as an indicator for companies listed in countries with mandatory ESG disclosure policies (Krueger, Sautner, Tand, and Zhong 2021). *Country ESG Sensitivity* is the value of the Environmental Performance Index (see Dyck et al. 2019 for an example of prior research using this metric).¹⁵

¹⁴ To identify ESG metrics we use the data items *disclosed_metric_name*, *overall_metric_type*, and *metric_type_itemized*, which contain the description of the specific variables used by the firm as well as their classification. We focus on metrics related to “sustainability”, “environmental, social, and governance”, and “corporate social responsibility”. The definitions of all these terms are close (Christensen et al. 2021). We also check manually the conformity of the names of the metrics with their classification by the data provider.

¹⁵ 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:

At the firm level, we include the following variables. *Log(CO₂)* is the natural logarithm of firm's direct (Scope 1) GHG emissions measured in metric tons of CO₂ equivalent. *Volatility* is the standard deviation of stock returns measured over the year (in percentage). *Size* is the logarithm of total assets. *Log(BM)* is the logarithm of the book-to-market ratio (book value of equity divided by market value of equity). We also include two measures of past performance. *ROA* is defined as net income scaled by total assets. *Return* is computed as the stock return over the year. *Leverage* is computed as the sum of long-term debt and debt in current liabilities over the firm's total assets. *Tangibility* is the ratio of property, plant, and equipment over the firm's total assets. 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. 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). 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 institutional shareholders (rationale 2). *Institutional Ownership* is the fraction of shares owned by institutional shareholders. *Controlling Shareholder* equals one if the firm is controlled by one shareholder (owning more than

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.

50% of the shares). Firms with a controlling shareholder are less sensitive to pressure from shareholders.

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, and zero otherwise. *ESG Rating* is the rating assigned to the company by Refinitiv. This rating is based on firm policies and outcomes related to ESG, and thus is a proxy for firms' efforts to improve ESG performance.

Finally, we include two variables aimed at exploring whether the adoption of ESG Pay is associated with individual perceptions and/or peer effects.¹⁶ *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).¹⁷ *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).

4.2 Discussion

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. Table OA.3 in the Online Appendix presents the results

¹⁶ Individual perceptions could relate to opinions about ESG and its impact on valuation. 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.

¹⁷ See also Adams and Ferreira (2009) and Cronqvist and Yu (2017) for other research reaching similar conclusions on the effect of women on corporate decision-making and, specifically, on CSR.

of repeating the analysis for each of the three dimensions of ESG (i.e., environmental, social, and governance). We structure the discussion of these results around the three rationales for ESG Pay adoption described in section 2.

The evidence in Table 4 provides support for the notion that ESG Pay reflects efficient contracting (rationale 1). To begin, 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 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 is consistent with larger firms being 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 of firms having powerful CEOs.¹⁸

¹⁸ One potential concern about Table 4 is that US firms are overrepresented in the sample, which could affect our inferences (US firms have on average different characteristics from international firms). In Table OA.1 we repeat the analysis of Table 4 restricting the subsample of US firms to the constituents of S&P 500 index. This restriction makes the subsample of US firms more comparable to other sample firms, as ISS ECA's coverage is mainly based on major indexes (for example, in Europe ISS ECA covers constituents of the STOXX 600 and the main stock index of each country). As shown in Table OA.1, we obtain the same inferences.

Table 4, Panel B, demonstrates a positive association between ESG Pay and the percentage of institutional ownership.¹⁹ 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 (rationale 2).²⁰ Table 4 also provides support for the notion that firms implement ESG Pay to strengthen the credibility of their ESG-related objectives (rationale 3). Table 4, Panel B, column (3) reveals that firms with environmental pledges and higher ESG ratings are more likely to base compensation contracts on ESG criteria.²¹

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 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 (as well as more specific perceptions on ESG Pay). Consistent with this, Table 4 also shows that linking pay to ESG metrics is more common among firms with more female directors.

¹⁹ 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.2 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).

²⁰ To provide some insight into the potential causality underlying this statistical relationship, we conduct an instrumental variables analysis on the association between this pay practice and institutional ownership. Online Appendix (Table OA.4) presents the details of the two-stage least squares (2SLS) estimation of the association between ESG Pay and foreign institutional ownership instrumented by MSCI membership. As shown in Table OA.4, we obtain the same inference as in Table 4.

²¹ 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.

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

To further explore whether the potential explanations for ESG Pay adoption described in section 2 find support in the data, we next analyze whether ESG Pay adopters differ from other firms in terms of engagement, voting, and trading by institutional shareholders.

5.1. Engagements by institutional investors

We first examine the engagements of institutional investors with their portfolio firms. To keep the analysis tractable, we focus on the three largest asset managers, BlackRock, Vanguard, and State Street (often referred to as the “Big Three”) for several reasons. These firms recently started to disclose investment stewardship reports (ISR), reporting on private engagements with their portfolio firms.²² Collecting this data for all investment funds represented in our sample would be prohibitively costly. Studying the Big Three is in and of itself interesting in light of the recent debate on the influence of these investment groups (e.g., Bebchuk and Hirst 2019; Azar et al. 2021).

²² According to the narrative in the investment stewardship reports (ISRs), most engagements go beyond sending a letter to the firm. For example, BlackRock's ISR states that the fund's investment stewardship department had “substantive dialogue with the companies listed as engaged firms.” The ISR also states that the fund “engages companies for the following reasons: (1) to ensure that BlackRock can make well-informed voting decisions; (2) to explain its voting and governance guidelines; (3) to convey its thinking on long-term value creation and sound governance practices.”

We hand collect engagement information from the recent ISRs published by the Big Three. We disregard engagements by letters and include only comprehensive engagements via calls and in-person meetings. The length of the period covered by the ISRs exhibits some variation across the three investors. BlackRock's ISRs include engagements data from 7/1/2017 to 6/30/2020. Vanguard's ISRs include engagements data from 7/1/2018 to 6/30/2020. State Street's ISRs include engagements data from 1/1/2014 to 12/31/2020. Vanguard and State Street classify engagements into broad categories and report reasons for the engagements. BlackRock simply publishes a list of firms contacted for comprehensive engagement.²³

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.²⁴ 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*,

²³ In absolute terms, we observe that, during the period covered by the ISR reports, the Big Three engage with a relatively large number of firms; BlackRock engaged with 3,102 firms, State Street engaged with 2,376 firms, and Vanguard engaged with 1,301 firms. In relative terms, however, the Big Three appear to engage with a relatively small percentage of their portfolio firms: BlackRock, Vanguard, and State Street annually engage with 9%, 3%, and 5% of their portfolio firms, respectively.

²⁴ The classification of engagements across the Big Three is not homogeneous. Vanguard includes engagements on environmental issues in the "oversight of strategy and risks" category. State Street includes engagements on environmental issues in the "Environmental/Social" category. While Blackrock does not classify engagements into categories, environmental issues are a commonly included in the agenda of Blackrock's engagements with portfolio companies (e.g., BlackRock 2019).

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:

$$Voting_Support_{it+1} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma * Controls_{it} + \tau_1 + \gamma_c + \delta_k + \varepsilon_{it} \quad (2)$$

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). 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:

$$\Delta Fund_Ownership_{ift+1} = \alpha + \beta * ESG\ Pay_{it} + \gamma * Controls_{it} + \tau_1 + \delta_{ft} + \varepsilon_{ift} \quad (3)$$

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.

5.4. Discussion

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. In the Online Appendix we present results for each of the three dimensions of ESG (Table OA.5) and explore the robustness to including firm fixed effects (Table OA.6). Table 6, columns (1) and (2), shows a positive association between ESG Pay and voting support, for both director elections and compensation-related proposals.²⁵ 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.²⁶

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

²⁵ In section OA.7 of the Online Appendix, we analyze the voting decisions by the Big Three. Consistent with the evidence on engagements by the Big Three in the previous section, ESG Pay is associated with higher support by these large investors.

²⁶ In Table OA.8 (Online Appendix) we analyze whether ESG pay explains investor behavior beyond the ESG ratings and emissions, we repeat the analysis including two additional control variables: *ESG Rating* (i.e., the ESG rating of firm i in year t) and ΔCO_2 (i.e., the fractional change in scope 1 CO₂ emissions in year t). In Table OA.9 we repeat the analysis measuring $\Delta Fund\ Ownership$ as changes from $t-1$ to $t+1$ to ensure that investors have access and time to process the contract information. The coefficient on *ESG Pay* remains positive and statistically significant.

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).

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.

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:

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

where $\Delta CO2$ is the change in the firm’s carbon dioxide emissions, measured in metric tons of CO₂ (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.²⁷ *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

²⁷ 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.

and t refer to firm i and year t , respectively. τ_i and δ_i denote year and firm-fixed effects, respectively.

6.2. ESG ratings

Next, we repeat the previous test replacing the dependent variable in equation (4), ΔCO_2 , with $\Delta ESG Rating$, defined as the change in ESG ratings with respect to the previous year.²⁸ 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.²⁹

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), ΔCO_2 , with ΔROA and *Return*. ΔROA 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. Discussion

Overall, the results in Tables 8-10 show that ESG Pay is associated with better ESG performance, but not 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

²⁸ Table OA.10 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.

²⁹ Beyond having a smaller coverage of our sample firms, KLD ratings are only readily available until 2018.

significant, which is consistent with the notion that introducing emission-specific metrics in top executive compensation contracts induces emissions reduction.³⁰

Table 9 shows that, when using $\Delta ESG Rating$ 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.³¹

Finally, Table 10 shows no significantly positive association 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 of ESG Pay with stock returns, a relation that appears to be driven by carbon specific KPIs.³²

Overall, Tables 8 and 9 are generally consistent with the view 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 the optimal contracting rationale. 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

³⁰ 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 (5) are consistent with earlier findings that firms located in countries with mandatory carbon reporting achieve incrementally lower carbon emissions (Downar et al. 2021).

³¹ 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).

³² In Table OA.11 in the Online Appendix we conduct additional tests to further mitigate the concern that the results in Tables 8-10 could be driven by the governance dimension of ESG (here we use the term “governance” in the traditional sense of mitigating agency frictions). As the tests control for this dimension or exclude it from the analysis, we find no support for the said concern.

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).

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 or/and 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 of the potential reasons underlying the adoption of ESG Pay, we conduct four additional tests.

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 (e.g., interest rate, coupon) that depend on specific ESG conditions (e.g., environmental covenants). We obtain data on these debt instruments from Bloomberg and

Refinitiv DealScan (see Kölbel and Lambillon (2022) and Kim et al. (2022) for a detailed description of this data). We estimate the following model:³³

$$ESG\ Debt\ Instrument_{it+1} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma * Controls_{it} + \tau_i + \delta_i + \varepsilon_{it} \quad (5)$$

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

Table 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 owners (rationale 2).

7.2. Pay for ESG performance

Table OA.12 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; 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.12 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

³³ See Amiram et al. (2021), Choy et al. (2021), and Flammer (2021) for a more detailed description of the features of ESG debt instruments.

5 basis points).³⁴ 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.13 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.13). 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 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.

7.4. *Cross-country variation*

Table OA.14 in the online appendix repeats the analysis in Tables 8 and 9 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, these countries exhibit higher values of *Country ESG sensitivity* and *ESG Disclosure*

³⁴ We obtain similar but insignificant results when we regress changes in compensation on changes in ESG performance.

Mandate, the measures used in prior sections to capture regulatory and social pressure to improve ESG performance.

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: CO₂ emissions, ESG ratings, and financial performance.

Overall, the results suggest that each of the three rationales could account for 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 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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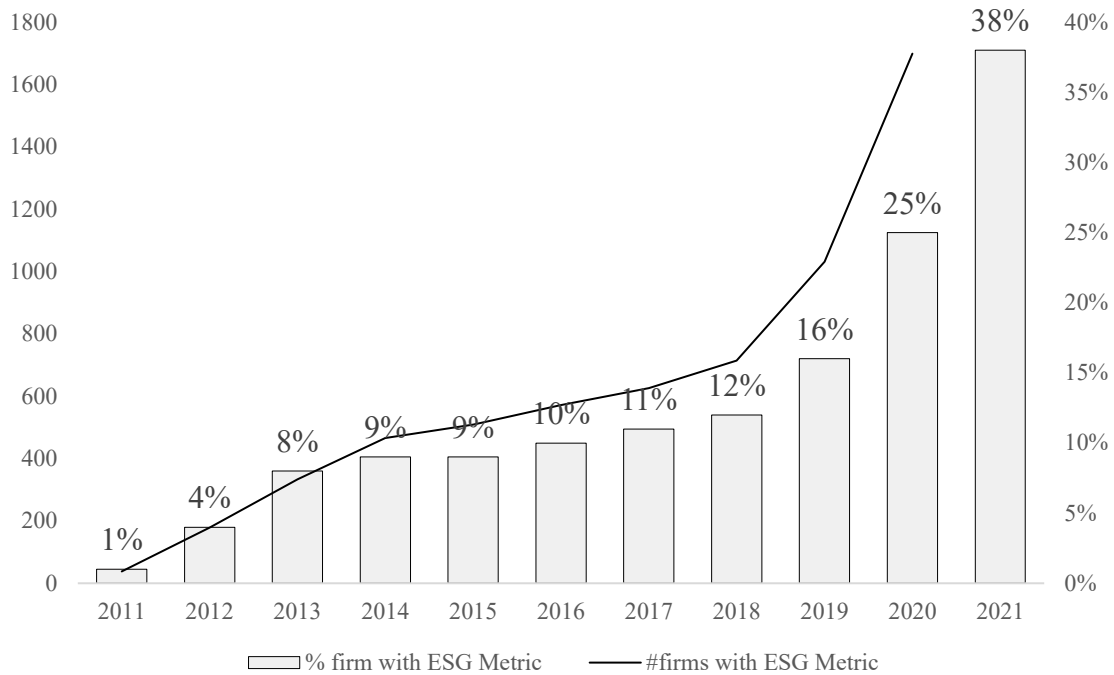
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Figure 1. Use of ESG Metrics in Executive Compensation

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

<i>ESG Pay</i>	Indicator variable that equals one if the company incorporates any ESG criterion in top executive compensation contracts in that year, and zero otherwise.
<i>Size</i>	Logarithm of the firm's total assets (expressed in millions of USD).
<i>BM</i>	Logarithm of the book value of common equity scaled by the market value of equity.
<i>ROA</i>	Net income scaled by total assets.
<i>Leverage</i>	Total debt scaled by total assets. Total debt is the sum of long-term debt and the debt in current liabilities.
<i>Tangibility</i>	Property, Plant and Equipment scaled by total assets.
<i>Dividends</i>	Total amount of dividends scaled by Net income
<i>Return</i>	Stock return of the firm compounded over the year (expressed as a fraction of the past market value)
<i>Volatility</i>	Standard deviation of the stock returns measured over the year, expressed in percentage.
<i>Log(CO2)</i>	Logarithm of the firm's direct GHG emissions measured in equivalents of metric tons of CO ₂
<i>Institutional ownership</i>	Fraction of the firm's equity owned by institutional investors
<i>Foreign IO</i>	Fraction of holdings of all institutions domiciled in a country different from the one in which the stock is listed.
<i>Controlling shareholder</i>	Indicator variable that equals one if company's insiders own more than 50% of the firm's outstanding equity, and zero otherwise.
<i>Industry with Significant Environmental Footprint</i>	Indicator variable for companies from transportation, utilities, steel, and oil & petroleum products
<i>ESG Disclosure mandate</i>	Indicator variable that equals one if a company's headquarters is in the country with mandatory ESG disclosure policies, and zero otherwise.
<i>Country ESG sensitivity</i>	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.
<i>Emission Pledge</i>	Indicator variable that equals one if a company has set emissions reduction targets through the "Science-based Targets Initiative", and zero otherwise.
<i>ESG Rating (Refinitiv)</i>	Refinitiv's ESG Score is an overall company score (from 0 to 1) based on the self-reported information in the environmental, social and corporate governance pillars.
<i>ESG Score (Sustainalytics)</i>	Sustainalytics' measure of ESG preparedness and performance that takes value from 0 to 100. A higher score indicates better ESG Performance.
<i>ESG Score (KLD)</i>	Score obtained from MSCI's KLD database, obtained by computing the number of "strengths" and subtracting from this the number of "weaknesses" identified by KLD as related to the firm's overall corporate social responsibility. A higher score indicates better ESG Performance.

<i>Carbon emissions</i>	Indicator variable that equals one if the company incorporates specific GHG emission metrics in executive compensation contracts, and zero otherwise.
<i>Other environmental variables</i>	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.
<i>Safety and security</i>	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.
<i>Diversity and inclusion</i>	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.
<i>Employee satisfaction and development</i>	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.
<i>Corporate culture</i>	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.
<i>Compliance</i>	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.
<i>Governance</i>	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to governance, and zero otherwise.
<i>Pct Independent</i>	Percentage of independent board members as reported by the company.
<i>Pct Female</i>	Percentage of female directors on the board.
<i>Pct Peer ESG Pay</i>	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).
<i>Abnormal Compensation</i>	Total compensation of the CEO as disclosed by the company minus the median CEO compensation of industry peers (expressed in USD)
<i>Engagement by Black Rock</i>	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.
<i>Engagement by State Street</i>	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.
<i>Engagement by Vanguard</i>	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).
<i>Engagement by at least one Big Three</i>	Indicator variable that equals one if BlackRock, State Street, or Vanguard engage with the firm, and zero otherwise.

Appendix B. Examples of ESG metrics

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






Type of ESG metric	Examples	Company
<i>a) Specific indicators:</i>		
Carbon emissions	Greenhouse gas emissions intensity at gold producing operations measured in kg CO ₂ e/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)
<i>b) Scores:</i>		
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 Bloomberg ESG disclosure score MSCI ESG rating “Great Place to Work Trust” Index Maintain citation in Bloomberg “Gender-Equality Index”	Italgas SpA (2020) Newmont Corporation (2020) Standard Bank Group Ltd. (2020) Admiral Group Plc. (2021) 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% ▲
Ethics 	15. 95% employees are working in a country with commitment and process in place to achieve gender pay equity	92%	99%	99.6% ▲
	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'd)

Panel B. Long-term incentives

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

Source: Schneider Electric's 2020 compensation report.

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

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

Panel A. Sample construction

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

Panel B. Sample distribution by year

Country	# obs.	# firms with ESG Pay	# firms by type of ESG metric								
			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

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

Panel D. Sample distribution by industry

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

<i>Entertainment</i>	220	45	1	3	5	3	7	4	4	6	2	1
<i>Printing and Publishing</i>	205	33	1	1	2	1	6	3	0	1	0	1
<i>Consumer Goods</i>	348	56	4	6	3	3	9	2	1	0	2	4
<i>Apparel</i>	169	32	1	6	0	3	2	1	1	1	1	1
<i>Healthcare</i>	257	57	0	3	9	1	15	4	5	5	2	0
<i>Medical Equipment</i>	566	122	1	1	2	0	7	2	0	2	3	1
<i>Pharmaceutical Products</i>	944	232	1	18	12	8	38	24	15	10	3	1
<i>Chemicals</i>	564	91	9	29	37	7	14	8	5	9	2	9
<i>Rubber and Plastic Products</i>	126	28	2	4	4	0	4	5	2	2	2	2
<i>Textiles</i>	39	7	1	2	1	0	1	1	1	1	0	1
<i>Construction Materials</i>	536	104	9	15	20	4	14	13	2	12	2	9
<i>Construction</i>	685	124	7	21	42	8	25	14	10	14	8	7
<i>Steel Works Etc</i>	328	55	6	9	18	3	11	8	4	3	2	6
<i>Fabricated Products</i>	23	8	1	0	1	0	0	0	0	1	0	1
<i>Machinery</i>	798	139	6	18	20	7	19	13	5	8	4	6
<i>Electrical Equipment</i>	185	36	0	5	6	0	4	3	0	3	1	0
<i>Automobiles and Trucks</i>	497	86	4	12	8	6	10	10	4	3	4	4
<i>Aircraft</i>	198	30	1	6	5	5	5	5	1	2	3	1
<i>Shipbuilding, Railroad Equipment</i>	46	8	0	2	2	0	1	1	1	0	0	0
<i>Defense</i>	32	7	0	0	1	0	1	0	0	1	0	0
<i>Precious Metals</i>	403	84	2	62	73	8	35	47	18	44	1	2
<i>Non-Metallic & Industrial Metal Mining</i>	382	76	10	38	54	7	34	28	13	26	0	10
<i>Coal</i>	70	17	0	9	10	0	2	1	3	2	1	0
<i>Petroleum and Natural Gas</i>	949	164	27	92	110	11	55	48	26	47	3	27
<i>Utilities</i>	985	148	19	73	87	25	63	41	24	22	17	19
<i>Communication</i>	595	106	7	16	8	11	23	16	7	11	10	7
<i>Personal Services</i>	252	51	0	2	6	0	11	5	3	3	0	0
<i>Business Services</i>	2,347	530	5	31	35	20	65	25	10	21	18	5
<i>Computers</i>	407	83	2	3	1	4	11	2	0	2	6	2
<i>Electronic Equipment</i>	941	189	3	8	7	10	19	12	2	4	6	3
<i>Measuring and Control Equipment</i>	314	59	0	0	2	2	1	0	1	0	1	0
<i>Business Supplies</i>	230	44	3	7	13	2	4	1	0	5	1	3
<i>Shipping Containers</i>	103	18	2	1	6	0	2	1	0	3	0	2
<i>Transportation</i>	794	148	9	20	39	6	29	12	10	17	10	9
<i>Wholesale</i>	676	130	4	8	24	9	18	11	5	13	4	4
<i>Retail</i>	1,261	225	2	19	18	8	35	13	8	15	10	2
<i>Restaurants, Hotels, Motels</i>	397	78	1	5	7	3	8	6	2	1	5	1
<i>Banking</i>	1,773	380	6	31	15	27	58	46	28	27	8	6
<i>Insurance</i>	820	143	3	19	6	12	35	27	11	14	5	3
<i>Real Estate</i>	384	88	4	14	5	4	13	16	5	12	3	4
<i>Trading</i>	749	143	3	12	3	13	32	25	17	14	8	3
<i>Other</i>	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
<i>Volatility</i>	22,603	9.79	19.83	25.01	26.98	32.22
<i>Size</i>	22,603	1.90	6.84	8.08	8.15	9.40
<i>Log(BM)</i>	22,603	0.82	-1.32	-0.78	-0.85	-0.30
<i>ROA</i>	22,603	0.13	0.01	0.04	0.03	0.08
<i>Leverage</i>	22,603	0.17	0.08	0.21	0.23	0.34
<i>Tangibility</i>	22,603	0.26	0.05	0.16	0.26	0.39
<i>Dividends</i>	22,603	0.60	0	0.27	0.36	0.54
<i>Returns</i>	22,603	0.50	-0.12	0.07	0.13	0.28
<i>Institutional ownership</i>	22,603	0.31	0.26	0.52	0.54	0.84
<i>Larger IO</i>	22,603	0.17	0.14	0.27	0.28	0.41
<i>Longer Term IO</i>	22,603	0.17	0.09	0.21	0.24	0.39
<i>Foreign IO</i>	22,603	0.12	0.05	0.10	0.13	0.17
<i>ESG Disclosure mand.</i>	22,603	0.45	0	0	0.28	1
<i>Country ESG sensitivity</i>	22,603	7.94	69.30	71.19	74.14	80
<i>Controlling shareholder</i>	22,603	0.31	0	0	0.11	0
<i>Log(CO2)</i>	22,603	2.97	8.32	10.19	10.23	12.04
<i>Emission Pledge</i>	22,603	0.10	0	0	0.01	0
<i>ESG Rating(Refinitiv)</i>	19,829	0.29	0.33	0.69	0.61	0.90
<i>ESG Rating (Sustainalytics)</i>	17,809	10.17	49	55.88	57.51	64.63
<i>ESG Rating (KLD)</i>	1,564	3.43	0	1	2.20	4
<i>ESG Metric</i>	22,603	0.37	0	0	0.17	0
<i>Carbon-Specific metric</i>	22,603	0.11	0	0	0.01	0
<i>Non Carbon-specific metric</i>	22,603	0.36	0	0	0.15	0
<i>Pct Independent</i>	19,882	20.32	61.54	77.78	71.82	87.50
<i>Pct Female</i>	19,885	12.35	11.11	20	20.14	28.57
<i>Pct Peer ESG Pay</i>	22,603	7.64	1.22	3.55	6.67	9.77
<i>Abnormal Compensation</i>	20,258	5.42	-0.87	0.93	2.85	4.63
<i>Log(Variable_Comp)</i>	18,441	1.16	12.83	13.58	13.49	14.28

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

Panel B. Partitioning by ESG Pay

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

Table 3. Contract Characteristics

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

Panel A. Types of ESG metrics:	<u># firms</u>
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:	<u># firms</u>
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	<u>% of comp.</u>
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 firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Panel A. Industry- and country-level variation

	Dependent Variable: <i>ESG Pay</i>						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Industry with Significant Environmental Footprints</i>						0.265*** (13.55)	
<i>ESG Disclosure Mandate</i>						0.098*** (6.73)	0.065*** (6.52)
<i>Country ESG sensitivity</i>						0.008*** (6.52)	0.002*** (2.90)
<i>Year FE</i>	YES			YES		YES	YES
<i>Industry FE</i>		YES		YES		YES	YES
<i>Country FE</i>			YES	YES		YES	
<i>Industry-year FE</i>					YES		
<i>Country-year FE</i>					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: <i>ESG Pay</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Log(CO2)</i>	0.013*** (4.64)					0.013*** (4.08)
<i>Volatility</i>	0.001** (2.46)					0.001*** (2.63)
<i>Size</i>	0.029*** (8.65)					0.015*** (3.14)
<i>Log(BM)</i>	0.004 (0.87)					0.007 (1.32)
<i>ROA</i>	-0.064*** (-2.93)					-0.081*** (-2.99)
<i>Leverage</i>	-0.057*** (-2.76)					-0.038 (-1.57)
<i>Tangibility</i>	0.122*** (4.66)					0.140*** (4.58)
<i>Dividends</i>	0.017*** (3.73)					0.020*** (3.68)
<i>Returns</i>	0.004 (0.74)					0.008 (1.43)
<i>Emission Pledge</i>		0.143*** (3.82)				0.116*** (3.13)
<i>ESG Rating (Refinitiv)</i>		0.184*** (12.67)				0.057*** (2.79)
<i>Institutional ownership</i>			0.140*** (7.17)			0.051** (2.02)
<i>Controlling shareholder</i>			-0.045*** (-3.51)			-0.033** (-1.97)

<i>Pct Independent</i>				0.002***		0.001***
				(6.76)		(3.35)
<i>Abnormal Compensation</i>				0.061***		0.001
				(7.72)		(0.07)
<i>Pct Female</i>					0.003***	0.001***
					(9.06)	(3.65)
<i>Pct Peer ESG Pay</i>					0.016***	0.012***
					(13.77)	(8.49)
<i>Year FE</i>	YES	YES	YES	YES	YES	YES
<i>Industry FE</i>	YES	YES	YES	YES	YES	YES
<i>Country FE</i>	YES	YES	YES	YES	YES	YES
R ²	0.28	0.27	0.25	0.28	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:	<i>ESG pay</i>			
	(1)	(2)	(3)	(4)
<i>Engagement by at least one Big Three</i>	0.05*** (4.52)			
<i>Engagement by BlackRock</i>		0.03*** (2.63)		
<i>Engagement by StateStreet</i>			0.05*** (3.10)	
<i>Engagement by Vanguard</i>				0.01 (0.66)
<i>Size</i>	0.04*** (14.12)	0.05*** (14.86)	0.04*** (14.56)	0.06*** (14.54)
<i>Log(BM)</i>	0.01 (1.32)	0.01 (1.10)	0.01 (1.19)	0.01 (0.61)
<i>ROA</i>	-0.10*** (-4.56)	-0.15*** (-5.41)	-0.10*** (-4.59)	-0.18*** (-4.40)
<i>Leverage</i>	-0.05** (-2.12)	-0.04 (-1.24)	-0.05** (-2.15)	-0.05 (-1.39)
<i>Tangibility</i>	0.15*** (5.13)	0.14*** (3.95)	0.15*** (5.15)	0.14*** (3.55)
<i>Dividends</i>	0.02*** (3.19)	0.02*** (2.65)	0.02*** (3.19)	0.03*** (2.71)
<i>Return</i>	0.01 (0.94)	0.01 (0.87)	0.00 (0.89)	-0.03** (-2.46)
<i>Year FE</i>	YES	YES	YES	YES
<i>Industry FE</i>	YES	YES	YES	YES
<i>Country FE</i>	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 fraction 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 fraction 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: Indep. Var.:	<i>Voting_Support</i>		<i>ISS_Recommendation</i>	
	(1)	(2)	(3)	(4)
<i>ESG Pay</i>	1.195*** (2.92)		0.040*** (5.70)	
<i>Carbon emissions</i>		1.292 (1.11)		0.054*** (3.44)
<i>Other environmental variables</i>		1.274** (2.03)		0.022*** (2.72)
<i>Safety and security</i>		0.868 (1.62)		0.022** (2.45)
<i>Diversity and inclusion</i>		-0.731 (-1.01)		0.006 (0.58)
<i>Employee satisfaction and development</i>		0.128 (0.24)		0.018** (2.16)
<i>Corporate culture</i>		-0.150 (-0.22)		-0.009 (-0.95)
<i>Compliance</i>		0.372 (0.77)		-0.008 (-0.84)
<i>Governance</i>		-0.175 (-0.23)		0.014 (1.51)
<i>Other</i>		0.565 (0.41)		0.030 (1.45)
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	0.19	0.19
# Obs.	11,929	11,929	12,052	12,052

Table 6. Shareholder Voting (cont'ed)

Panel B. Compensation-related proposals

Dep. Variable: Indep. Var.:	<i>Voting Support</i>		<i>ISS Recommendation</i>	
	(1)	(2)	(3)	(4)
<i>ESG Pay</i>	0.772 (1.53)		0.028*** (2.79)	
<i>Carbon emissions</i>		2.191** (1.99)		0.059** (2.39)
<i>Other environmental variables</i>		1.579** (2.07)		0.030* (1.94)
<i>Safety and security</i>		0.695 (0.99)		0.007 (0.53)
<i>Diversity and inclusion</i>		-0.643 (-0.70)		-0.001 (-0.07)
<i>Employee satisfaction and development</i>		0.622 (0.90)		0.024* (1.91)
<i>Corporate culture</i>		-0.306 (-0.37)		0.015 (0.96)
<i>Compliance</i>		-0.397 (-0.42)		-0.040* (-1.82)
<i>Governance</i>		-1.302 (-1.24)		-0.011 (-0.60)
<i>Other</i>		1.174 (0.95)		0.027 (0.99)
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	0.23	0.23	0.11	0.11
# Obs.	11,495	11,495	11,622	11,622

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 $\Delta Fund\ Ownership$ 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:	$\Delta Fund\ Ownership$	
	(1)	(2)
<i>ESG Pay</i>	0.029*** (2.63)	
<i>Carbon emissions</i>		0.024 (1.14)
<i>Other environmental variables</i>		-0.029 (-1.49)
<i>Safety and security</i>		0.015 (0.94)
<i>Diversity and inclusion</i>		0.012 (0.81)
<i>Employee satisfaction and development</i>		0.024 (1.40)
<i>Corporate culture</i>		-0.022 (-0.70)
<i>Compliance</i>		-0.012 (-1.01)
<i>Governance</i>		0.012 (0.60)
<i>Other</i>		0.124 (1.46)
<i>Size</i>	0.021 (1.31)	0.021 (1.31)
<i>Log(BM)</i>	-0.032*** (-3.77)	-0.032*** (-3.77)
<i>ROA</i>	0.182*** (3.38)	0.176*** (3.25)
<i>Leverage</i>	-0.174* (-1.87)	-0.174* (-1.88)
<i>Tangibility</i>	-0.102* (-1.69)	-0.096 (-1.60)
<i>Dividends</i>	-0.004 (-1.28)	-0.004 (-1.40)
<i>Return</i>	0.010 (0.53)	0.010 (0.51)
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 ΔCO_2 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:	ΔCO_2	
	(1)	(2)
<i>ESG Pay</i>	-0.07 (-0.85)	
<i>Carbon emissions</i>		-0.77*** (-2.88)
<i>Other environmental variables</i>		-0.11 (-1.02)
<i>Safety and security</i>		-0.05 (-0.34)
<i>Diversity and inclusion</i>		-0.04 (-0.15)
<i>Employee satisfaction and development</i>		0.14 (0.91)
<i>Corporate culture</i>		0.06 (0.56)
<i>Compliance</i>		-0.11 (-0.78)
<i>Governance</i>		-0.06 (-0.46)
<i>Other</i>		0.02 (0.16)
<i>Size</i>	-0.09 (-1.46)	-0.10 (-1.61)
<i>Log(BM)</i>	-0.02 (-0.54)	-0.02 (-0.46)
<i>ROA</i>	0.18* (1.86)	0.18* (1.90)
<i>Leverage</i>	0.27 (1.54)	0.28 (1.60)
<i>Tangibility</i>	0.57 (1.60)	0.57 (1.60)
<i>Dividends</i>	0.00 (0.11)	0.00 (0.07)
<i>Returns</i>	0.00 (0.16)	0.01 (0.21)
<i>Year FE</i>	YES	YES
<i>Firm FE</i>	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 $\Delta ESG Rating$ 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:	$\Delta ESG Rating$ (Refinitiv)		$\Delta ESG Rating$ (Sustainalytics)		$\Delta ESG Rating$ (KLD)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>ESG Pay</i>	-0.001 (-0.17)		0.233* (1.95)		1.004** (2.42)	
<i>Carbon emissions</i>		0.001 (0.07)		-0.583** (-2.12)		6.660*** (10.82)
<i>Other environmental variables</i>		-0.000 (-0.10)		-0.105 (-0.59)		-0.244 (-0.24)
<i>Safety and security</i>		-0.002 (-0.34)		0.242 (1.26)		0.075 (0.13)
<i>Diversity and inclusion</i>		0.021*** (3.08)		0.045 (0.17)		3.877*** (3.18)
<i>Employee satisfaction and development</i>		-0.002 (-0.48)		0.260 (1.49)		0.704 (0.92)
<i>Corporate culture</i>		0.001 (0.15)		0.169 (0.80)		1.417 (1.23)
<i>Compliance</i>		-0.000 (-0.08)		-0.057 (-0.21)		1.505* (1.87)
<i>Governance</i>		-0.003 (-0.43)		-0.354 (-1.59)		0.795 (0.54)
<i>Other</i>		0.005 (0.46)		0.566* (1.87)		0.922 (1.17)
<i>Size</i>	0.004 (1.15)	0.004 (1.16)	0.393*** (3.17)	0.369*** (2.96)	0.917 (1.35)	1.063 (1.58)
<i>Log(BM)</i>	-0.010*** (-4.03)	-0.010*** (-4.01)	0.041 (0.43)	0.050 (0.52)	-0.133 (-0.37)	-0.148 (-0.42)
<i>ROA</i>	-0.113*** (-7.58)	-0.113*** (-7.58)	0.221 (0.55)	0.237 (0.59)	-2.801 (-1.13)	-2.846 (-1.14)
<i>Leverage</i>	0.010 (0.72)	0.010 (0.70)	-0.424 (-0.99)	-0.383 (-0.89)	-1.920 (-1.03)	-1.578 (-0.86)
<i>Tangibility</i>	-0.035* (-1.69)	-0.034 (-1.64)	-0.505 (-0.79)	-0.479 (-0.74)	4.647 (1.37)	5.402 (1.61)
<i>Dividends</i>	-0.010***	-0.010***	0.054	0.051	0.089	0.053

<i>Returns</i>	(-5.73)	(-5.77)	(0.98)	(0.93)	(0.54)	(0.32)
	-0.000	-0.000	-0.187**	-0.184**	0.085	0.095
	(-0.18)	(-0.20)	(-2.48)	(-2.45)	(0.31)	(0.35)
<i>Year FE</i>	YES	YES	YES	YES	YES	YES
<i>Firm FE</i>	YES	YES	YES	YES	YES	YES
<hr/>						
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 ΔROA 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:	ΔROA		<i>Return</i>	
	(1)	(2)	(3)	(4)
<i>ESG Pay</i>	-0.003 (-0.94)		-0.032* (-1.82)	
<i>Carbon emissions</i>		-0.015* (-1.89)		-0.079*** (-2.66)
<i>Other environmental variables</i>		-0.001 (-0.37)		0.007 (0.35)
<i>Safety and security</i>		-0.008 (-1.46)		-0.027 (-0.94)
<i>Diversity and inclusion</i>		0.002 (0.38)		-0.002 (-0.07)
<i>Employee satisfaction and development</i>		0.004 (0.93)		0.024 (0.98)
<i>Corporate culture</i>		0.001 (0.11)		-0.083*** (-3.11)
<i>Compliance</i>		0.004 (0.55)		-0.015 (-0.36)
<i>Governance</i>		0.010 (1.43)		0.014 (0.50)
<i>Other</i>		-0.010 (-1.13)		-0.053 (-1.62)
<i>Controls</i>	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES
<i>Firm FE</i>	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 in that year, 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

Indep. Var.:	Dep. Var.: <i>ESG-linked Loan</i>		Dep. Var.: <i>Green Loan</i>		Dep. Var.: <i>ESG-linked Bonds</i>		Dep. Var.: <i>Green Bonds</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>ESG Pay</i>	0.014*** (4.07)	0.013*** (2.87)	-0.000 (-0.32)	-0.001 (-0.76)	0.003** (2.11)	0.007*** (2.60)	0.012*** (2.83)	0.017*** (3.76)
<i>Size</i>	0.004*** (7.20)	-0.005 (-1.58)	0.001*** (2.80)	-0.002** (-2.36)	0.001*** (3.02)	-0.003* (-1.66)	0.008*** (8.57)	-0.010*** (-3.40)
<i>Log(BM)</i>	-0.002** (-2.27)	-0.003 (-1.29)	-0.000 (-0.91)	-0.001 (-0.90)	0.000 (0.12)	-0.001 (-1.18)	-0.000 (-0.02)	-0.004 (-1.61)
<i>ROA</i>	-0.005 (-1.45)	0.006 (0.94)	-0.002* (-1.95)	0.002 (1.51)	0.001 (0.60)	0.004 (1.28)	-0.010*** (-2.99)	0.013*** (2.81)
<i>Leverage</i>	0.001 (0.28)	0.010 (0.86)	-0.001 (-0.73)	-0.004 (-1.38)	0.005** (2.26)	0.009 (1.40)	-0.011** (-2.06)	-0.046*** (-3.98)
<i>Tangibility</i>	0.009 (1.50)	-0.002 (-0.09)	0.005 (1.51)	0.001 (0.22)	-0.005** (-2.28)	-0.024** (-2.01)	0.023*** (2.64)	-0.018 (-1.33)
<i>Dividends</i>	-0.000 (-0.32)	-0.001 (-0.41)	-0.000 (-0.82)	0.000 (0.20)	0.000 (0.12)	-0.000 (-0.02)	-0.002 (-1.32)	0.000 (0.35)
<i>Returns</i>	-0.001 (-1.55)	-0.002 (-1.33)	0.001 (1.46)	0.000 (0.45)	-0.001** (-2.14)	-0.001** (-2.17)	0.002 (1.38)	-0.003** (-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

Indep. Var.:	Dep. Var.: <i>ESG-linked Loan</i>		Dep. Var.: <i>Green Loan</i>		Dep. Var.: <i>ESG-linked Bonds</i>		Dep. Var.: <i>Green Bonds</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Carbon emissions</i>	0.061*** (3.09)	0.061*** (2.78)	0.022 (1.61)	0.021* (1.85)	0.012 (1.41)	0.017 (1.55)	0.018 (0.89)	0.020 (1.12)
<i>Other environmental variables</i>	0.006 (1.00)	0.010 (1.14)	-0.003 (-1.14)	-0.002 (-0.51)	-0.001 (-0.28)	-0.003 (-0.63)	0.034*** (4.64)	0.038*** (3.95)
<i>Safety and security</i>	0.002 (0.35)	0.007 (0.87)	-0.001 (-0.22)	0.002 (1.20)	0.003 (1.06)	0.009* (1.89)	-0.025*** (-4.03)	-0.020*** (-2.88)
<i>Diversity and inclusion</i>	0.008 (0.71)	0.015 (1.09)	0.000 (0.06)	0.002 (0.44)	-0.001 (-0.15)	0.000 (0.02)	0.019 (1.32)	0.011 (0.78)
<i>Employee satisfaction and development</i>	0.005 (0.66)	-0.003 (-0.42)	-0.001 (-0.83)	-0.002 (-0.81)	0.000 (0.13)	-0.001 (-0.18)	0.001 (0.14)	0.004 (0.54)
<i>Corporate culture</i>	-0.006 (-0.89)	0.002 (0.27)	-0.003 (-1.29)	-0.003 (-1.02)	-0.003 (-0.87)	-0.002 (-0.59)	-0.006 (-0.70)	-0.005 (-0.54)
<i>Compliance</i>	0.004 (0.42)	-0.001 (-0.06)	0.003 (0.49)	-0.000 (-0.00)	0.001 (0.17)	0.003 (0.50)	0.014 (0.99)	0.007 (0.56)
<i>Governance</i>	0.007 (0.75)	-0.011 (-1.07)	0.005 (1.16)	0.000 (0.02)	0.004 (0.87)	0.003 (0.53)	0.010 (0.95)	0.000 (0.03)
<i>Other</i>	-0.001 (-0.07)	0.004 (0.28)	-0.001 (-0.18)	-0.002 (-0.98)	0.003 (0.49)	0.003 (0.40)	0.010 (0.63)	0.006 (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