ESG Metrics in Executive Compensation: a Multitasking Approach*

Vikas Agarwal† Juan-Pedro Gómez‡ Kasra Hosseini§ Manish Jha¶

March 20, 2025

ABSTRACT

We model the multitasking nature of managerial incentives when ESG metrics are introduced jointly with standard financial or accounting metrics in executive compensation. Building on insights from multitasking theory, we predict that pay-performance sensitivity or *dollar delta* of standard metrics should optimally decrease when value-adding but less measurable ESG goals are introduced in executive pay. Empirical tests support the existence of a significant *opportunity cost* for the effort of executives to improve ESG metrics that firms mitigate by decreasing incentives to achieve standard metrics. Consistently, the downward adjustment in dollar delta of standard metrics is shown to be larger when the number of ESG metrics increases, they are less material to the firm, or less measurable. This adjustment is not offset by a simultaneous increase in the time vesting delta or the executive's total compensation. The tests show differential effect of E, S, and G metrics on the dollar delta of standard metrics. In sharp contrast, there is no variation in the dollar delta of standard metrics when a new standard metric (instead of an ESG metric) is introduced. Overall, the evidence is consistent with efficient contracting in the presence of multitasking when ESG metrics are introduced in executive compensation.

JEL classification: J33, M12, M14, G34, G32

Keywords: ESG pay, multitasking, pay-performance sensitivity, delta, incentives, executive compensation, metrics

*Very preliminary. Please do not cite or circulate without permission from the authors. Vikas Agarwal thanks the CFR in Cologne for its continued support. Juan-Pedro Gómez thanks the EU Commission through the program CIVICA (grant EXECML 2004-26) for its generous support. We are thankful to Swaminathan Kalpathy for sharing the code for delta calculations.

†J. Mack Robinson College of Business. Georgia State University. Email: vagarwal@gsu.edu

‡IE Business School. IE University. Email: juanp.gomez@ie.edu

§School of Industrial Engineering, Eindhoven University of Technology. Email: k.hosseini@tue.nl

¶J. Mack Robinson College of Business. Georgia State University. Email: mjha@gsu.edu

1 Introduction

The integration of Environmental, Social, and Governance (ESG) metrics into executive compensation has become a focal point in corporate governance research, driven by increasing societal and investor emphasis on sustainability. This practice, referred to as "ESG Pay," has experienced rapid adoption worldwide with the percentage of firms linking executive pay to ESG performance metrics growing globally from less than 10% in 2010 to close to 40% in 2021, with an exponential increase after 2018 (Gantchev, Giannetti, and Hober 2024).

A nascent but fast growing body of academic research on this topic has shown that the inclusion of these metrics is often accompanied by improvements in ESG outcomes such as reduced carbon emissions and better ESG ratings (Cohen et al. 2023), and firm value (Flammer, Hong, and Minor 2019). These metrics, however, have little impact on executives' total compensation (Gantchev, Giannetti, and Hober 2024), because they typically carry a very modest weight in compensation schemes and tend to be highly discretionary and poorly specified, which, arguably, makes them easy to manipulate by rent-extracting managers (Bebchuk and Tallarita 2022).

We claim that these apparently contradictory findings can be reconciled in an efficient contracting framework when we recognize that ESG goals are intrinsically different from "standard," well-studied objectives. To begin with, it is not possible to estimate the sensitivity of stock price to ESG goals because that would require long enough historical data that are not available to firms while structuring executive compensation. Moreover, ESG objectives are often difficult to quantify (with, arguably, differences among E, S or G objectives) and relatively novel. In sharp contrast, there exists a battery of widely accepted and measurable accounting and market/financial metrics (like EBIT or total shareholder return, TSR) that firms have been using for a long time to motivate and compensate their executives for standard tasks. The interplay of incentives for tasks of different nature and measurability is the object of multitasking theory (Prendergast 1999, Baker 1992, and Holmstrom and Milgrom 1991).

A key insight from this theory is that firms can provide incentives for a value-enhancing but difficult-to-measure task by optimally reducing its *opportunity cost*, that is, by decreasing the incentives for other tasks that are easier to measure or quantify and which compete for managers' limited time and costly effort.

In this paper, we explicitly model the multitasking nature of managerial incentives when ESG metrics are introduced jointly with standard compensation metrics. Building on the seminal model of Holmstrom and Milgrom 1991, we derive a set of empirically testable predictions. Specifically, we predict that the pay performance sensitivity or *delta* of a standard incentive metric (accounting or market) will decrease after the introduction of an ESG metric. Moreover, the decrease in delta is expected to be larger (more negative) when the number of new ESG metrics is higher, the ESG metrics are less material to the firm's core business, or when ESG metrics are less measurable.

Empirically, we test these hypotheses on a set of more than 22,000 *metric-executive-firm-year* observations. Each observation includes an accounting or market metric used in performance-vested share or option awards granted to 5,671 unique executives from 735 unique US firms during the period 2008-2023.[1] Following the methodology in Bettis et al. 2018 and using the contract variables from the ISS Incentive Lab database together with market and firm accounting data, we estimate *dollar delta* for each metric, that is, the expected dollar increase in executive compensation conditioned on that metric when the stock price increases by 1%. This is a widely used measure of managerial incentives (e.g. Shue and Towsend 2017, Gormley, Matsa, and Milbourn 2013, Coles, Daniel, and Naveen 2006). We then test whether incentives, using dollar delta as the proxy, associated with standard metrics (hence, tasks) decrease when an ESG metric is introduced in the executive's compensation contract.

Supporting the model's main prediction, the average dollar delta of standard (accounting

[1] 38% of the observations belong to executives whose compensation contracts included at least one ESG metric. This percentage has increased from 23% in 2008 to 56% in 2023, with a sharp increase in the last 3 years of the sample period.

or market-based) metrics decreases by about $4,400 when the executive's compensation includes at least one ESG metric after including high-dimensional *metric-executive-firm-award type-vesting schedule* fixed effects. That is, we estimate the change in dollar delta of a particular standard metric (Sales, TSR, EPS, Operating Income, EBITDA, EBIT, Earnings, Stock Price or Net Income) for the same executive in the same firm for the same type of award (stock options or equity) and vesting schedule (cliff, ratable, or unknown) when at least one ESG metric is introduced in the executive's compensation contract. This result is both statistically (at the 1% level) and economically significant, representing a roughly 19% reduction in the average dollar delta of standard metrics ($23,560) in our sample. This result is robust to the inclusion of time-varying firm, contract, and executive characteristics as well as to the use of alternative pay-performance sensitivity measure, namely pay-performance elasticity or delta. Moreover, underscoring the distinctive nature of ESG metrics, our falsification test results show that addition of standard metrics has an insignificant effect on the dollar delta, suggesting that our main findings are unlikely to be spurious and attributable to unobservable factors.

We then show that environmental (E), social (S), and governance (G) metrics have different impact on dollar delta. When only E metrics are introduced (1.7% of the observations), the decrease in dollar delta (in absolute value) is greater with an average drop of about $7,500 (significant at the 10% level). The decrease in dollar delta is smaller, about $4,000 (significant at the 5% level) when only S metrics are introduced in the contract (15% of the observations). However, there is a statistically insignificant drop in dollar delta after the introduction of only G metrics (2.2% of the observations). Analyses of a pairwise combination of E, S, or G metrics confirm the dominating effect of E metric followed by S metric in muting the incentives associated with standard metrics. G metric only matters in conjunction with the introduction of E and S metric in executive compensation contracts.

We also test the model's prediction on the number of ESG metrics. The intuition is that the introduction of a larger number of ESG metrics in the contract requires even more

attention from the executive and increases the opportunity cost of any marginal effort devoted to standard, more measurable tasks. Our empirical tests support this prediction and show a non-linear impact of the number of ESG metrics on the dollar delta of standard metrics. Thus, introducing a single ESG metric has a statistically and economically weaker impact on the dollar delta. However, if there are two or three ESG metrics, the average drop in the dollar delta is about \$7,200 (significant at the 5% level) and it becomes (negative) \$8,400 when the number of ESG metrics is four or more (significant at the 1% level).

The model also predicts that the opportunity cost of the time and effort the executive devotes to standard tasks should be lower (i.e., more attenuated drop in dollar delta) when the ESG objectives are more complementary with the standard accounting or market goals delegated to the executive. We proxy complementarity through the SASB materiality index. Thus, for each ESG metric in a grant, we determine whether it is material for the company's industry. Our empirical tests show a different pattern for the E, S, and G metrics. When only material E metrics are introduced, the tests rejects the model prediction: the dollar delta decreases additional \$5,200 (significant at the 5% level). However, for material S and G metrics, the tests support the model: the expected unconditional drop in dollar delta is neutralized when the ESG goals consist only of material S metrics. If the ESG objectives are measured only with material G metrics, the effect on dollar delta is actually a net increase of about \$4,000.

Finally, we test whether more measurable ESG metrics are associated with a less pronounced drop in dollar delta. Ultimately, if ESG metrics were as quantifiable as standard metrics, they could be directly incentivized with no opportunity cost (i.e., zero expected drop in dollar delta) for the time and effort the executive could invest in standard metrics. We proxy measurability through a continuous variable at the grant level, representing the percentage of ESG performance metrics with explicit performance benchmarks. These benchmarks define the minimum threshold, target, and maximum performance levels of ESG metrics that trigger, respectively, the minimum, target, and maximum payout in the

performance-vested compensation scheme. A higher value of measurability indicates that ESG metrics within the grant are, on average, more quantifiable and structured around clear performance criteria. Empirically, the test show a pattern similar to that documented for materiality. When only measurable E metrics are introduced in the contract, dollar delta drops by an extra $6,000, rejecting the model's prediction. When only measurable S metrics are introduced, the reduction in dollar delta is roughly (positive) $3,000 lower. There is no statistically significant net variation in dollar delta where only measurable G metrics are introduced.

All these results are shown to be robust to alternative classifications of ESG metrics (corresponding to alternative ESG dictionaries), excluding grants with more than 12 (99th percentile) ESG metrics or observations prior to 2018 (the year ISS Incentive Lab introduced a major revision in the classification of ESG metrics). The documented decrease in standard performance-based incentives associated to the inclusion of ESG metrics is not offset by any increase in incentives associated to time vesting equity or option rewards. There is no evidence either that the executive's total compensation changes when ESG metrics are introduced. Taken together, we interpret these results as supportive of efficient ESG pay design in the presence of multitasking.

1.1 Literature review and contribution

Efficient contracting theory (Holmström 1979) predicts that any observable metric correlated with the unobservable effort of an executive to improve firm performance should be included in the compensation contract. If ESG metrics align management incentives with the creation of long-term shareholder value, they would play a role similar to other non-financial performance measures like customer satisfaction or product quality previously analyzed in the literature (e.g. Ittner, Larcker, and Rajan 1997, Dutta and Reichelstein 2003, and De Angelis and Grinstein 2014). In that case, ESG metrics should be included in executives' compensation packages together with standard accounting, operating, or market-based metrics.

Cohen et al. 2023 find evidence consistent with this view using global executive compensation data. They also show that ESG incentives are associated with improvements in ESG ratings and curbing carbon emissions but they do not predict higher levels of executive pay. Their evidence also supports the role of investors such as the "Big Three" asset managers (BlackRock, Vanguard, and State Street) in pushing firms to adopt ESG metrics in executive compensation contracts.

Challenging this view, Bebchuk and Tallarita 2022, argue that ESG pay is poorly designed, with ambiguous or straightforwardly unmeasurable goals and payoffs, all of which facilitate rent extraction by managers, raising concerns about its implementation and efficacy. Also critical with the inclusion of ESG metrics in executive pay, Edmans 2023 advocates for replacing all performance-based bonuses, based both on financial and non-financial metrics (like ESG), with restricted shares that executives are required to hold for many years.

Alternatively, a growing body of literature suggests that firms increasingly aim to cater to their stakeholders' preferences for ESG outcomes (e.g., Hart and Zingales 2017 and Pástor, R. Stambaugh, and L. Taylor 2023). If this pressure is large enough, institutional investors and shareholder groups with intrinsic ESG preferences would prioritize sustainability over short-term financial returns (Riedl and Smeets 2017, Hartzmark and Sussman 2019). In this case, ESG pay would be used to to align the executive's objectives with shareholder and stakeholder preferences for ESG outcomes. Consistent with this hypothesis, Gantchev, Giannetti, and Hober 2024 show that the adoption of ESG pay is associated with higher levels of institutional investor engagement, voting, and trading activities, as well as stronger shareholder support for director elections and compensation proposals. Interestingly, these authors also find no significant effect of ESG pay in the level of executive pay. All this leads them to interpret ESG pay as a signal about the firm's strategy and, in particular, its commitment to sustainability initiatives, particularly to counter accusations of "greenwashing" (Grewal and Serafeim 2020, Marquis, Toffel, and Zhou 2016).

In our paper, we are agnostic as to whether ESG pay is an efficient mechanism to create long-term managerial incentives or it is rather meant to align executives' effort with shareholders' social and environmental concerns.[2] We contribute to the literature on ESG pay by shifting the focus from the *level* to a so far neglected aspect of ESG pay design: the *interplay* between traditional shareholder value-maximizing accounting and market-based metrics and ESG metrics.[3] Specifically, we derive testable predictions from a multitasking model in which executives must allocate limited time and effort to competing standards (accounting or market) and ESG tasks to show that US firms in our sample find it optimal to decrease the incentives (dollar delta) for standard metrics to reduce the opportunity cost of managers' time and effort spent on less measurable ESG metrics. These findings are consistent with efficient contracting in the presence of multitasking.

The remainder of the paper is structured as follows. Section 2 presents a model to motivate our empirically testable predictions. Section 3 presents the data sources and the construction of the variables used in the empirical analysis. The results of the empirical tests are analyzed in Section 4. We explore additional predictions from the model in Section 5. Section 6 reports the robustness tests before concluding with Section 7.

2 Theoretical motivation

2.1 The model setup

Our model is based in the multitasking model of Holmstrom and Milgrom 1991. There is only one period. At the beginning of the period, the CEO (the agent) is hired by the firm (the principal). At that point, the CEO decides whether to accept the contract and, if so,

[2]See Pástor, R. Stambaugh, and L. Taylor 2021 and Pástor, R. F. Stambaugh, and L. A. Taylor 2022 for, respectively, a theoretical and empirical investigation on the motives underlying investors' demand for ESG stocks.

[3]Edmans 2023 mentions the conflict of explicitly incentivizing some ESG objectives at the expense of other less explicit ESG objectives. Instead, we analyze the opportunity cost of incentives for ESG metrics in relation to standard metrics.

how much effort to exert in two different tasks. The firm decides the CEO's compensation. At the end of the period, the uncertainty is resolved: the CEO receives her pay, and the firm shareholders receive the residual net profit.

One of the tasks the CEO must undertake is a *standard* task: to increase shareholder value. The other task is new and is meant to either decrease the firm's environmental impact (E), increase the firm's social contribution (S), or improve its governance (G). Both tasks contribute to the firm's profit. Let $t^T = (t_s, t_n)$ denote the effort vector, with $t_s \geq 0$ the CEO's effort choice for the standard task and $t_n \geq 0$ the effort choice for the new task. Effort is not observable and has a personal cost for the CEO given by the convex cost function:[4]

$$C(t) = t_s^2/2 + t_n^2/2 + \gamma t_s t_n \tag{1}$$

The parameter $0 < \gamma < 1$ denotes the substitution intensity of both tasks. That is, how much the cost of one task increases when the manager devotes effort to the other task.

Each effort generates a signal captured by a performance metric. For instance, the performance metric associated with t_s could be an accounting figure, like Earnings Per Share (EPS) or Earnings Before Interests and Taxes (EBIT), or a market performance metric, like Total Shareholder Return (TSR). Likewise, the performance metric associated with t_n could be an ESG ranking or some metric of carbon emission. The signals are distributed as follows:

$$x(t) = t + \epsilon \tag{2}$$

where ϵ is the noise around the signals, normally distributed with mean zero and variance Σ. Let σ_s^2, σ_n^2 denote the variance of, respectively, the standard and the new signals while σ_{sn} denotes the covariance. We assume, without loss of generality, that the covariance of both signals is zero, that is, $\sigma_{sn} = 0$. The company's gross profit is an increasing and concave

[4]This is, for instance, the cost function assumed in Bénabou and Tirole 2016.

function of both signals: $B(x(t))$.

2.2 The CEO's problem

The CEO is risk averse with risk-aversion parameter $r > 0$ and has an exponential utility defined over her compensation. The compensation consists of a performance-based component linear in both metrics and a fixed salary:

$$w(x) = \beta + \alpha^T x \tag{3}$$

$\alpha^T = (\alpha_s, \alpha_n)$, where $\alpha_s \geq 0$ and $\alpha_n \geq 0$ measure the sensitivity of the compensation to the observable metrics x_s and x_n, respectively; β is the fixed salary.

Under these assumptions, the CEO solves for her optimal level of effort for each task that maximizes the expected utility of her compensation net of the cost of effort. Given the utility function and the normal distribution of the noise term, this is equivalent to choosing t to maximize the certainty equivalent payoff CE. Replacing (2) into (3) this is equivalent to:

$$\max_t \quad \alpha^T t - \tfrac{1}{2} r \alpha^T \Sigma \alpha + \beta - C(t)$$

This yields the optimal effort condition $\alpha_i = \frac{\partial C(t)}{\partial t_i}$ for $i = \{s, n\}$. Differentiating this condition with respect to t and inverting it yields the CEO's implicit incentive compatibility constraint

$$\frac{\partial t}{\partial \alpha} = [\partial C_{ij}]^{-1} \tag{4}$$

where

$$[\partial C_{ij}] = \begin{pmatrix} 1 & \gamma \\ \gamma & 1 \end{pmatrix}$$

is the matrix of second partial derivatives of the cost function with respect to the effort employed in both tasks. In other words, the sensitivity of the CEO's optimal effort with respect to the performance incentive (α) in the contract decreases with the convexity of the cost function.

2.3 The firm's optimal contract problem

The firm is assumed to be risk neutral. It chooses the contract (β, α) that maximizes the firm's expected profit net of the CEO's expected compensation subject to the CEO's certainty equivalent being above her reservation level $\bar{CE}$, and the incentive compatibility constraint that implicitly defines effort $t(\alpha)$ as a function of α in equation (4):

$$\begin{aligned} \max_{\beta,\alpha} \quad & B(x(t(\alpha))) - \beta - \alpha^T t(\alpha) \\ \text{s.t.} \quad & \alpha^T t(\alpha) - \tfrac{1}{2} r \alpha^T \Sigma \alpha + \beta - C(t(\alpha)) \geq \bar{CE} \\ & \tfrac{\partial}{\partial \alpha} t(\alpha) = [\partial C_{ij}]^{-1} \end{aligned}$$

Holmstrom and Milgrom 1991 show that the optimal contract (β^*, α^*) satisfies the first-order conditions:

$$\begin{aligned} \tfrac{\partial B}{\partial x} = & \quad (I + r[C_{ij}]\Sigma)\, \alpha^* \\ \beta^* = & \quad \bar{CE} - \alpha^{*T} t(\alpha^*) + \tfrac{1}{2} r \alpha^{*T} \Sigma \alpha^* + C(t(\alpha^*)) \end{aligned}$$

For the standard metric, the first condition can be written as follows:

$$\frac{\partial B}{\partial x_s} = \alpha_s^* + r\sigma_s^2(\alpha_s^* + \gamma \alpha_n^*) \tag{5}$$

Let us define Δ_s as *Dollar Delta*, that is, the variation in the CEO's performance-based dollar pay linked to the standard metric when the company's gross profit (in general, the stock performance) changes:

$$\Delta_s = \frac{\partial \alpha_s^* x_s}{\partial B} = \alpha_s^* \frac{\partial x_s}{\partial B}$$

Replacing the inverse of (5) into the previous equation we obtain:

$$\Delta_s = \left(1 + r\sigma_s^2 \left(1 + \gamma \frac{\alpha_n^* \sigma_n^2}{\alpha_s^* \sigma_s^2}\right)\right)^{-1} \tag{6}$$

The prediction from equation (6) can be easily generalized to the introduction of $N > 1$ new non-standard metrics with the same pairwise level of substitution γ across tasks:

$$\Delta_s = \left(1 + r\sigma_s^2 \left(1 + \frac{\gamma}{\alpha_s^* \sigma_s^2} \sum_{m=1}^{N} \alpha_m^* \sigma_m^2\right)\right)^{-1} \tag{7}$$

In other words, the model predicts that when tasks are substitutes ($\gamma > 0$) the dollar delta of the standard metric should decrease relative to the case when the new task is independent from the standard task ($\gamma = 0$) or the case when there is no new task ($\alpha_n = 0$). Moreover, the decrease in delta should be higher (in absolute value) when the number N of the new tasks increases and when the the new tasks are noisier (higher σ_n^2). In summary, informed by this model, we predict that:

Prediction 1 *The dollar delta of a standard (accounting or market) incentive metric will decrease after the introduction of an ESG metric. Moreover, the decrease in dollar delta is expected to be smaller (less negative) when:*

Prediction 2 *The number of new ESG metrics is higher.*

Prediction 3 *The ESG metrics are more material to the firm's core business.*

Prediction 4 *The ESG metrics are more measurable.*

These predictions are the basis for our empirical analysis.

3 Data

We collect data on performance goals from the ISS Incentive Lab database, which compiles detailed, comparable information on incentive awards from firms' proxy statements (DEF 14A). This includes performance metrics, performance goals, and payout structures for all short-term and long-term awards granted to named executive officers (NEOs). We focus only on performance-vesting (p-v) provisions, which trigger the vesting of stock and option grants to executives based on one or several performance metrics. The criteria for the number of units vested are commonly based on one or more accounting, stock-price, or ESG metrics[5], such as EPS, total shareholder return, or emissions reduction. By restricting our sample to grants with complete information[6], we obtain a final dataset of 15,303 grants awarded to executives of 735 U.S. companies from 2008 to 2023. We obtain accounting information from Compustat and stock price data from CRSP.

3.1 Key Variables

Dollar Delta: A continuous variable that measures the change in expected performance metric value (in dollars) following a 1% increase in stock price. Mathematically, we define it as:[7]

$$\text{Dollar Delta} = \text{Stock Price} \times \text{Number of Shares} \times \text{Percent Vest} \times \text{Delta} \tag{8}$$

Our analysis is at the metric level. The first product on the right-hand side of equation (8) quantifies the dollar value of the executive's compensation if she meets all the target performance goals in the grant award. The variable, *Percent Vest*, indicates the portion of the

[5] As we are studying the effect of the introduction of ESG metrics on the financial component of executive awards, our sample includes only accounting and stock price performance metrics.

[6] To calculate our dependent variable, we require detailed grant information for delta simulation, including the performance metric triggering vesting (accounting or stock price), the back-end instrument (stock or option), the number of awarded units, the performance evaluation period, the option's exercise price and expiration date, the exact grant date, and the correlation between the accounting metric and stock price.

[7] If the award is in stock options, we replace stock price and number of shares with the Black-Scholes value of the option and number of options, ensuring consistency in valuation.

award tied to a particular metric in a given evaluation period.[8] Delta captures the sensitivity of the executive's compensation tied to a specific metric to changes in the company's stock price. We calculate textitDelta using the simulation method from Bettis et al. 2018, where the metric expected value is simulated under an initial stock price of \$1, and then increased by 1% to observe the change in the metric's discounted expected value. A detailed example is provided in Appendix A.1.

Measurability: A continuous variable at the grant level representing the percentage of ESG performance metrics with explicit performance benchmarks. These benchmarks define the minimum required achievement for vesting, the standard level linked to a target payout, and the maximum threshold beyond which additional gains are capped. A higher value of measurability indicates that ESG metrics within executive compensation are more quantifiable and structured around clear performance criteria.

Table A.5 in the Appendix illustrates different examples of ESG metrics in grants for NEOs, where the third column indicates whether a metric is measurable. For instance, while "Cumulative Carbon Emissions Reduction" is measurable because the benchmarks at which vesting is triggered for the executive are explicitly defined,"Progress toward our long-term sustainability goal" is a broader and rather ambiguous metric with no specific benchmark in the compensation structure.

Materiality: A continuous variable at the grant level representing the percentage of ESG performance metrics in a grant that are classified as material based on the SASB Materiality Map. The SASB framework assesses the relevance of ESG metrics across industries, identifying those most critical to a company's performance and risk exposure. For each ESG metric in a grant, we determine whether it is material for the company's industry. The last column in Table A.5 indicates whether each ESG metric is considered material to the firm. Since materiality depends on the industry in which a company operates, the fourth column provides an example of an industry where such a metric is

[8]Even if there is a single performance metric, it can be evaluated over several consecutive periods, with different weights applied to each period.

included in executive compensation.

Table 1 shows the trend in the performance metrics, the percentage of observations that include ESG metrics, and the measurability and materiality of ESG metrics in our sample. Notably, there is a sharp increase in the percentage of observations that include at least one ESG metric in executive compensation contracts over time, from about 23% in 2008 to more than 56% by the end of our sample period in 2023. Interestingly, there is significant time-series variation in both measurability and materiality of ESG metrics but neither shows a monotonically increasing or decreasing trend.

[Insert Table 1 about here]

3.2 Identification of ESG Compensation Contracts

To identify ESG-related compensation contracts, we initially considered using the categorization provided in the ISS Incentive Lab dataset, which classifies metrics as "Accounting," "Stock Price," "Other," or "ESG." However, we found that prior to 2018, ESG metrics were either left blank or categorized as "Other".[9] This limitation prompted us to instead rely on the available details for each disclosed metric.[10] The available details for each disclosed performance metric provide brief descriptions of the criteria tied to compensation contracts, such as "Total Recordable Incident Rate," "Development Contribution - Adjusted EBITDA," and "Environmental Health and Safety Performance." These descriptions are available for both ESG and non-ESG contracts.

To classify these metrics as related to ESG, we use the keyword list provided by Gantchev, Giannetti, and Hober 2024, which consists of 1,034 terms associated with Environmental, Social, and Governance (ESG) factors. For each keyword in their list, we evaluated its effectiveness in identifying ESG metrics by analyzing its performance in the post-2018 period, when ISS Incentive Lab began explicitly categorizing ESG metrics.

[9] There are also examples of financial goals that are categorized as "Other."

[10] The "metricother" column in the ISS Incentive Lab dataset provides additional details on disclosed metrics. For some examples of ESG metrics, see Table A.4.

Specifically, we calculate the false positive ratio for each keyword, defined as the proportion of instances where the keyword incorrectly classifies a metric as ESG related (i.e., the metric was not marked ESG by ISS) relative to the total number of matches. Keywords with a false positive ratio greater than 50% are deemed unreliable and excluded from our classification process. This filtering results in the removal of 81 keywords, leaving a refined set of 953 terms used to identify ESG-related metrics. Section A.3 in the Appendix provides the complete list of the 953 keywords, along with examples of removed terms and their corresponding false positive matches. These examples illustrate cases where the removed keywords incorrectly classified non-ESG metrics as ESG-related.

Finally, a compensation contract is considered as an ESG contract if the executive has at least one ESG metric in their contract.[11] Figure 1 shows the percentage of ESG contracts based on the ISS Incentive Lab classification and the keyword-based classification from our approach. The percentage of ESG contracts is nearly zero from 2008 to 2017 using the ISS Incentive Lab classification, indicating that ESG metrics were not explicitly identified during this period. The percentage of contracts with an ESG component has increased since 2018. Our keyword-based classification identifies more ESG contracts than ISS's classification post-2018, as ISS does not categorize certain descriptions as ESG, such as "Environmental and Safety," "Green Growth Decarbonization," and "Implementation and Announcement of Climate Action Plan," despite their likely relevance to ESG.

[Insert Figure 1 about here]

3.3 Descriptive Statistics

As discussed in Section 3, our final sample includes 22,437 observations. Each observation is a unique performance metric at the executive-year level. Table 2 presents the descriptive statistics for the key variables in our analysis. The *ESG Metric* variable, a dummy indicator, has a mean value of 0.38, indicating that 38% of the observations in our sample

[11] An example of an ESG contract with two metrics is provided in Section A.1 of the Appendix.

have at least one ESG metric in the compensation contract. There is significant variability in the inclusion of ESG metrics in compensation contracts (standard deviation of 0.486). The *Dollar Delta*, is the pay-performance sensitivity and captures the managerial incentives for the standard metrics. It has a mean value of $23,559.5, with a median of $5,934.1, suggesting a positively skewed distribution. This variable also shows considerable variation, as indicated by a standard deviation of $68,253.3.

[Insert Table 2 about here]

4 Baseline Results

In this section, we test the first of the four predictions of the model. We estimate the following regression to test the first prediction: there should be a decrease in the dollar delta of a standard metric (accounting or market) when an ESG metric is included in the compensation contract. Specifically, we estimate:

$$\textit{Dollar Delta}_{e,f,m,a,v,y} = \beta \cdot \textit{ESGMetric}_{e,f,y} + \alpha_{e,f,m,a,v} + \alpha_y + \epsilon_{e,f,m,a,v,y} \tag{9}$$

Dollar Delta, or pay-performance sensitivity, is estimated for an executive e employed at firm f, where the compensation contract for fiscal year y is associated with metric type m, award group a, and vesting schedule v. The variable *ESGMetric* is an indicator equal to one if the executive's compensation contract includes an ESG metric, otherwise zero. We cluster standard errors at the executive level to account for heteroskedasticity and possible executive-level correlations among observations.

To mitigate potential omitted variable bias, we include high-dimensional fixed effects to control for confounding factors that may influence both pay sensitivity and the inclusion of an ESG metric in an executive's compensation contract. We incorporate fixed effects for fiscal years to account for temporal variations in executive pay. In our baseline regressions, we also

include executive-firm-metric-awardgroup-vestingschedule fixed effects to capture differences in pay-performance sensitivity across executives and various pay structures.

The coefficient of primary interest, β, measures the average difference in *Dollar Delta*, or pay-performance sensitivity, when an ESG-related metric is included in the compensation contract, after controlling for fiscal year, executive and other contract-level factors that can affect the pay-performance sensitivity.

Table 3 reports the results. Model (1) includes fixed effects by year, executive firm and metric to control for time-invariant characteristics across these dimensions. Model (2) imposes stricter executive-firm-metric fixed effects in addition to year fixed effects. This specification allows us to estimate the effect of ESG metrics on the dollar delta for the same executive at the same firm and for the same metric. Finally, Model (3) includes even higher-dimensional fixed effects to absorb any variation across the award type (stock option or equity) and vesting schedule (cliff, ratable, or unknown). Regardless of the specification, we observe roughly similar estimates ranging from \$4,010.6 to \$4,454.1, all significant at the 1% level, indicating that the incorporation of ESG metrics into executive compensation contracts significantly reduces the managerial incentives for executives to achieve standard financial goals. These estimates are also economically large considering that the average dollar delta in our sample is \$23,559.5. The findings of this baseline analysis support the first main prediction of the model motivated by multitasking theory. Moreover, these results are not sensitive to our choice of the pay-performance sensitivity measure. When we use the pay-performance elasticity or just the delta, our results continue to hold (see Appendix Table A.6). For example, in the most comprehensive specification in column (3) with high-dimensional fixed effects, delta goes down by 0.2% (8% of the the sample average delta of 2.5%) after incorporation of ESG metrics into executive compensation contracts. Finally, we find similar effect on dollar delta when we restrict our sample either only to financial metrics or only to accounting metrics as shown in Appendix Table A.7.

[Insert Table 3 about here]

4.1 Placebo Test with respect to Standard Metric

Are ESG metrics indeed intrinsically different from standard metrics because of the challenges in predicting their sensitivity to stock prices and measurability? Would inclusion of any standard metric yield the same results as in our baseline analysis? We conduct a falsification test to address these questions. To this end, we estimate a regression similar to Equation 9 but after replacing the primary independent variable from *ESGMetric* to *StandardMetric*, which is a binary variable set to one for *executive-firm-year* observations where executives' compensation contracts include at least one standard (accounting or market) metric for that year, otherwise zero. In alternative specifications, we also control for *TotalMetric*, which accounts for the total count of both ESG and standard metrics included in the compensation contract of an executive in a firm in a given year.

Results reported in column (1) of Table 4 show that in sharp contrast to our baseline results in Table 3, there is an insignificant effect of inclusion of additional standard metrics in compensation contracts of executives. This finding remains unchanged in column (2) when we control for the total number of metrics. In contrast, introduction of ESG metrics decreases the pay-performance sensitivity by \$4,473 as shown in column (3) even after controlling for the total number of metrics in the compensation contract. Collectively, this falsification test mitigates potential concerns that our baseline results are spurious and driven by unobservable factors.

[Insert Table 4 about here]

5 Heterogeneity Analysis

5.1 Heterogeneity by the type of ESG metric

A natural question after the analysis in the previous section is whether the effect on managerial incentives or dollar delta varies by the type of ESG metric included in the compensation

contract. To this end, we construct a set of binary variables corresponding to a single metric exclusively included in the contract (E, S, or G) or a pairwise combination of any two of these three metrics. The results reported in Table 5 show that when only environmental metrics are included in the contract, it has the largest effect on weakening the managerial incentives with a statistically significant reduction of $7,446.8 in dollar delta (see Model 1). The effect of only including social metrics is roughly 55% of including only environmental goals in the compensation contract. Model (2) shows a decrease $4,087.3, significant at the 5% level.

In contrast, requiring the executives to achieve governance objectives does not significantly influence the pay-performance sensitivity associated with financial metrics. The estimated coefficient in Model (3) is negative but insignificant at conventional levels. Models (4) through (6) explore the effect of pairwise combination of two of the three ESG metrics. All the combinations are associated with a decrease in dollar delta. Estimates for the E or S metric in Model (4) and for E or G metric in Model (6) are smaller than those for the E metric alone, confirming that the S and G metrics are less influential in affecting the managerial incentives associated with financial goals. Comparing the estimate for G or S metric in Model (5) with that for only S metric in Model (2) also underscores the dominance of social metrics over governance metrics in driving the pay-performance sensitivity.

[Insert Table 5 about here]

5.2 Heterogeneity by the number of ESG metrics

We continue our empirical investigation by testing the next three predictions of our model that follow from our first main prediction. Recall that our second prediction relates to how the number of ESG metrics affects the dollar delta. If the executive is required to pursue numerous ESG goals, it would require her to pay more attention and increase the opportunity cost of the marginal effort needed to meet standard financial goals. We would therefore expect a larger decline in the dollar delta as the number of ESG metrics increases.

Table 6 reports the results from three different specifications. Model (1) uses a continuous variable counting the number of ESG metrics. The coefficient estimate on this variable indicates a reduction of $877.5 in dollar delta for an increase of one ESG metric in the contract. Models (2) and (3) allow for nonlinear relation between the number of ESG metrics and dollar delta. Model (2) uses an indicator variable of whether the executive's compensation contract includes at least one ESG metric along with the continuous variable from Model (1). Only the indicator variable turns out to be significantly negative suggesting that having at least one ESG metric has the dominant effect. Model (3) extends this analysis to a piecewise-linear kind of specification where we include indicator variables for one, two to three, and four or more ESG metrics. Results indicate that including more ESG metrics has a larger and nonlinear effect on dollar delta (about $8,400 for four or more ESG metrics compared to $7,200 for two to three ESG metrics).

[Insert Table 6 about here]

5.3 Heterogeneity by materiality and measurability of ESG metric

The last two predictions of the model are related to materiality and measurability of ESG metrics. The intuition is as follows. More material are the ESG metrics, greater would be the complementarity in the ESG and standard/financial objectives assigned to the executive. This implies that the opportunity cost of the time and effort that the executive needs to devote to standard objectives should be lower. Put differently, decrease in dollar delta should be smaller or less negative when ESG metrics are more material. A similar argument applies to measurability of ESG metrics. If ESG metrics can be quantified and measured, it would also reduce the opportunity cost for the time and effort to achieve standard goals. That is, decrease in dollar delta should be smaller or less negative when ESG metrics are more measurable.

Table 7 and Table 8 report the results for testing these two last predictions. Using SASB materiality index, we observe that introduction of only material S or G supports the third

prediction as the coefficient estimates are positive and significant ($5,439.5 for only S in Model 2 and $8,365.4 for only G in Model 3). Adding these figures to the significantly negative coefficient on *ESGMetric* shows that decrease in dollar delta is muted for material S or G metrics. Surprisingly, this prediction is not supported when only E metrics are included in the contract as the coefficient estimate on only E material is negative and significant. When we consider combinations of material E, S, and G metrics in Models (4) through (7), only a combination of materiality of G and S metrics supports the prediction of smaller decrease in dollar delta with greater materiality.

[Insert Table 7 about here]

Moving on to the last prediction pertaining to measurability of ESG metrics, measurability of S alone supports the prediction as the coefficient estimate on Only S Measurable is positive ($3,223.0) and significant at the 5% level in Model (2). Combining the measurability of S with G metrics in Model (5) also leads to similar conclusion with a coefficient estimate of $2,996.8 that is also significant at the 5% level. However, measurability of E metric is associated with a larger decrease in dollar delta while the measurability of G metric does not significantly influence dollar delta.

[Insert Table 8 about here]

6 Robustness tests

This section presents a series of robustness tests to confirm the validity of our main findings.

6.1 Robustness to including firm and executive controls

While our fixed effects account for variations in pay associated with different compensation contracts for an executive, they do not control for time-varying firm and executive characteristics that may influence both the pay-performance sensitivity and the likelihood of

including an ESG metric in an executive's contract. Table 9 includes additional time-varying firm and executive characteristics that have been identified as key determinants of dollar delta (Gormley, Matsa, and Milbourn 2013). The inclusion of these controls does not alter our results. We continue to observe significantly negative coefficient estimates for *ESGMetric* with magnitudes comparable to those reported in Table 3.

[Insert Table 9 about here]

6.2 Robustness to different ESG metric classification

To further assess the robustness of our classification methodology, we employ four alternative approaches to distinguishing ESG-related metrics from non-ESG metrics. Specifically, we classify "metric other" text as an ESG metric using the following methods: (1) ChatGPT 4o-mini, where we ask whether the text pertains to an ESG-related compensation contract; (2) the comprehensive keyword set introduced in Gantchev, Giannetti, and Hober 2024, which includes all 1,034 words; (3) ISS Incentive Lab data, which classifies compensation contracts as ESG or non-ESG (available since 2018); and (4) an extended version of ISS Incentive Lab, where pre-2018 metrics are labeled as ESG if they appear as ESG in the post-2018 ISS classification. The results of these alternative classifications are presented in Table 10, all of which align with our baseline findings.

[Insert Table 10 about here]

6.3 Alternative incentives: Time vesting incentives and total compensation

Executives may receive alternative incentives to those provided by the performance vested equity or options analyzed so far. One possibility is time-vesting equity or options, not conditioned on any performance metric. Besides equity- or option-based incentives, executives may also receive cash bonuses and fixed salaries. In this section, we test whether

the documented decrease in performance-based incentives after the introduction of ESG metrics is offset to some extent by an increase in time-vesting or other type of incentives.

To test this hypothesis, we calculate time-vesting delta as the change in the dollar value of the CEO's overall compensation including both stock holdings and option positions for a 1% change in the firm's stock price. We adopt the methodology of Coles, Daniel, and Naveen 2006 and Core and Guay 2002, which distinguishes among different time-vesting option components such as new option grants, non-exercisable options, and exercisable options. Note that the time-vesting delta is different from the performance delta defined in Section 3.1, which is computed for an individual performance metric. Total compensation is defined as the logarithm of the sum of salary, bonus, stock and option compensation received by the executive in a year.

The results are reported in table 11. We do not find a significant relation between the introduction of ESG metrics and variation in either the delta of time-vested incentives or the total compensation.

[Insert Table 11 about here]

6.4 Robustness to restricted sampling

Finally, we conduct two additional robustness tests, presented in Table 12. In the first test, we exclude executives with more than 12 ESG metrics in their compensation contracts, as this represents the 99th percentile of the treatment sample, ensuring that our results are not driven by outliers. In the second test, we restrict the sample to post-2017 data, given that ISS Incentive Lab offers more comprehensive coverage of executive compensation contracts from 2018 onward. Our results remain consistent across both specifications.

[Insert Table 12 about here]

7 Conclusion

Despite the progress made in understanding ESG incentives in executive compensation, significant questions remain unaddressed. Scholars continue to debate whether ESG pay is primarily a tool for genuine sustainability efforts or a mechanism for managing reputation. In addition, the long-term financial and societal benefits of ESG pay remain largely unexplored.

This paper contributes to the growing body of literature on ESG pay by analyzing the interplay between incentives for standard versus ESG metrics in executive compensation. Informed by the predictions derived from a multitasking model where executives must allocate limited time and effort to competing standard and ESG tasks, we show that US firms in our sample find it optimal to decrease the incentives (dollar delta) for standard metrics to reduce the opportunity cost of managers' time and effort spent in less measurable ESG metrics. The findings are consistent with efficient contracting in the presence of multitasking.

Several novel patterns in ESG pay are revealed by our study. The number of ESG metrics introduced reduces the optimal provision of incentives for standard tasks non-linearly, showing a convex relation between the decline in dollar delta and the number of ESG metrics. When more material (i.e., more complementary with traditional tasks) and more measurable E metrics are introduced in isolation into the executive's compensation, we observe that dollar delta decreases even further, contrary to the model's prediction. For S and (partially) G metrics, materiality and measurability reduces the intensity of the down-adjustment for the standard dollar delta. Further theoretical and empirical analysis is necessary to understand the different impact across E, S, and G metrics on the power of standard metrics.

References

Baker, George P. (1992). "Incentive Contracts and Performance Measurement". In: *Journal of Political Economy* 100.3, pp. 598–614.

Bebchuk, Lucian A. and Roberto Tallarita (2022). "The Perils and Questionable Promise of ESG-Based Compensation". In: *Journal of Corporation Law* 48, pp. 37–75.

Bénabou, Roland and Jean Tirole (2016). "Bonus Culture: Competitive Pay, Screening, and Multitasking". In: *Journal of Political Economy* 124.2, pp. 305–370.

Bettis, J. Carr et al. (2018). "Performance-vesting provisions in executive compensation". In: *Journal of Accounting and Economics* 66.1, pp. 194–221.

Cohen, Shira et al. (2023). "Executive Compensation Tied to ESG Performance: International Evidence". In: *Journal of Accounting Research* 61.3, pp. 805–853.

Coles, Jeffrey L., Naveen D. Daniel, and Lalitha Naveen (2006). "Managerial incentives and risk-taking". In: *Journal of Financial Economics* 79.2, pp. 431–468.

Core, J. and W. Guay (2002). "Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility". In: *Journal of Accounting Research* 40.3, pp. 613–630.

De Angelis, David and Yaniv Grinstein (2014). "Performance Terms in CEO Compensation Contracts". In: *Review of Finance* 19.2, pp. 619–651.

Dutta, Sunil and Stefan Reichelstein (2003). "Leading Indicator Variables, Performance Measurement, and Long-Term Versus Short-Term Contracts". In: *Journal of Accounting Research* 41.5, pp. 837–866.

Edmans, Alex (2023). "Applying Economics—Not Gut Feel—to ESG". In: *Financial Analysts Journal* 79.4, pp. 16–29.

Flammer, Caroline, Bryan Hong, and Dylan Minor (2019). "Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes". In: *Strategic Management Journal* 40.7, pp. 1097–1122.

Gantchev, Nickolay, Mariassunta Giannetti, and Marcus Hober (2024). "Beyond ESG: Executive Pay Metrics and Shareholder Support". In: *FEB-RN Research Paper No. 26/2024*.

Gormley, Todd A., David A. Matsa, and Todd Milbourn (2013). "CEO compensation and corporate risk: Evidence from a natural experiment". In: *Journal of Accounting and Economics* 56.2, pp. 79–101.

Grewal, Jody and George Serafeim (2020). "Research on Corporate Sustainability: Review and Directions for Future Research". In: *Foundations and Trends(R) in Accounting* 14.2, pp. 73–127.

Hart, Oliver and Luigi Zingales (2017). "Companies Should Maximize Shareholder Welfare Not Market Value". In: *Journal of Law, Finance, and Accounting* 2.2, pp. 247–275.

Hartzmark, Samuel M. and Abigail B. Sussman (2019). "Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows". In: *Journal of Finance* 74.6, pp. 2789–2837.

Holmstrom, Bengt and Paul Milgrom (1991). "Multitask Principal–Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design". In: *The Journal of Law, Economics, and Organization* 7, pp. 24–52.

Holmström, Bengt (1979). "Moral Hazard and Observability". In: *The Bell Journal of Economics* 10.1, pp. 74–91.

Ittner, Christopher D., David F. Larcker, and Madhav V. Rajan (1997). "The choice of performance measures in annual bonus contracts". In: vol. 72, pp. 231–255.

Marquis, Christopher, Michael W. Toffel, and Yanhua Zhou (2016). "Scrutiny, Norms, and Selective Disclosure: A Global Study of Greenwashing". In: *Organization Science* 27.2, pp. 483–504.

Pástor, Ľuboš, Robert F. Stambaugh, and Lucian A. Taylor (2021). "Sustainable investing in equilibrium". In: *Journal of Financial Economics* 142.2, pp. 550–571.

— (2022). "Dissecting green returns". In: *Journal of Financial Economics* 146.2, pp. 403–424.

Pástor, Ľuboš, Robert F. Stambaugh, and Lucian A. Taylor (2023). *Green Tilts*. NBER Working Papers 31320. National Bureau of Economic Research, Inc.

Prendergast, Canice (1999). "The Provision of Incentives in Firms". In: *Journal of Economic Literature* 37.1, pp. 7–63.

Riedl, Arno and Paul Smeets (2017). "Why Do Investors Hold Socially Responsible Mutual Funds?" In: *Journal of Finance* 72.6, pp. 2505–2550.

Shue, Kelly and Richard Towsend (2017). "How Do Quasi-Random Option Grants Affect CEO Risk-Taking?" In: *The Journal of Finance* 72.6, pp. 2551–2588.

Figure 1: Share of Executives that have ESG Metric in their Compensation Contracts.

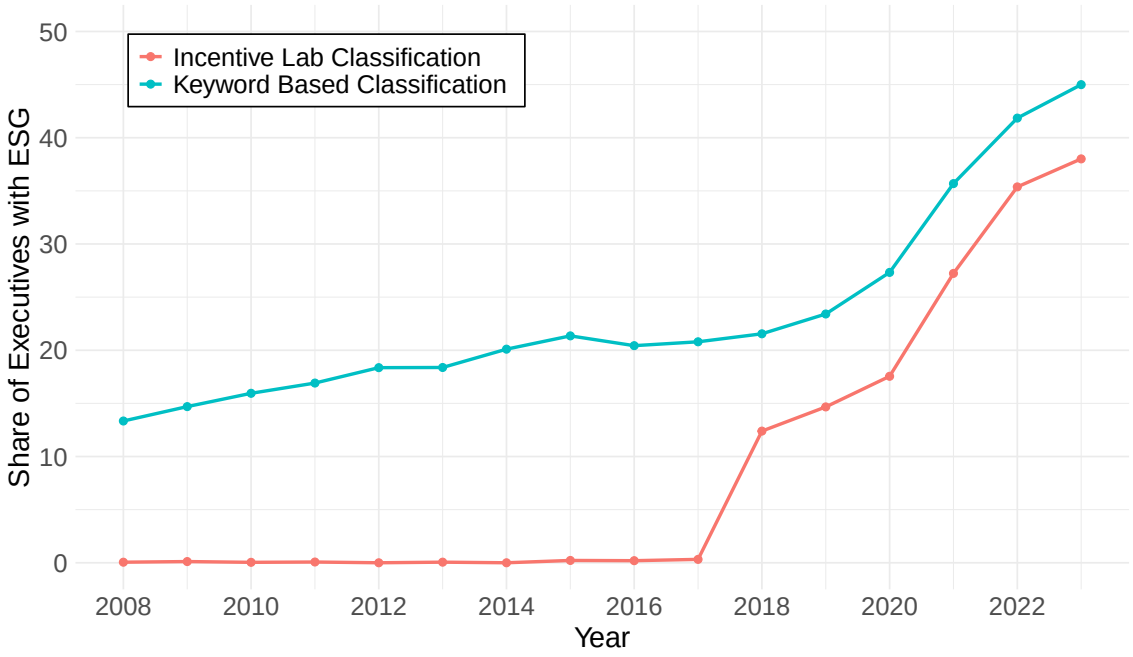


Table 1: Annual Distribution of Performance-Based Metrics for NEOs

This table reports the annual distribution of performance-based metrics for named executive officers (NEOs) in our sample. *# Metrics* counts the number of observations. *% ESG Metrics* shows what percentage of the observations belong to a compensation package that includes at least one ESG metric that year. *% Measurable* is a continuous variable at the grant level representing the percentage of ESG performance metrics with explicit performance benchmarks. *% Material* is a continuous variable at the grant level representing the percentage of ESG performance metrics in a grant that are classified as material based on the SASB Materiality Map.

Fiscal Year	# Metrics	% ESG Metrics	% Measurable ESG	% Material ESG
2008	532	22.9	25.3	18.9
2009	383	29.0	28.6	32.9
2010	467	36.6	51.9	39.1
2011	555	20.2	48.5	48.2
2012	518	26.8	42.7	26.3
2013	468	27.1	64.4	15.6
2014	541	29.9	67.4	9.47
2015	456	20.4	79.5	19.5
2016	514	23.7	66.3	18.8
2017	604	23.8	63.2	18.6
2018	2,294	24.9	58.5	38.0
2019	2,687	29.6	56.9	34.2
2020	2,892	32.1	51.0	30.6
2021	3,013	45.4	53.8	28.7
2022	3,485	54.6	54.6	30.8
2023	3,028	56.3	52.0	31.0
Aveg. 2008-2023	**22,437**	**38.2**	**54.0**	**30.7**

Table 2: Summary Statistics

This table reports the summary statistics of the variable used in our empirical analyses. We estimate *Dollar Delta* following the Equation 8. The *ESG Metric* is a binary variable set to one for executives whose compensation contracts include an ESG-related metric that year. *Only E Metric* is a dummy variable that takes value of one if all ESG metrics in the contract are of the E type, otherwise zero. We define analogous variables for S and G categories. *One ESGMetric* identifies observations in contracts with a single ESG metric. We construct analogous variables for *Two-Three ESGMetrics* and *Four or More ESGMetrics*. We follow Gormley, Matsa, and Milbourn 2013 in constructing firm- and executive- level controls. The contract variables are from ISS Incentive Lab.

	Observation	Mean	SD	p25	Median	p75
Dollar Delta	22,437	23,559.5	68,253.3	1,230.3	5,934.1	17,861.5
ESG Metric	22,437	0.382	0.486	0	0	1
Only E Metric	22,437	0.017	0.129	0	0	0
Only S Metric	22,437	0.147	0.354	0	0	0
Only G Metric	22,437	0.022	0.148	0	0	0
One ESGMetric	22,437	0.175	0.38	0	0	0
Two-Three ESGMetric	22,437	0.123	0.329	0	0	0
Four or More ESGMetric	22,437	0.084	0.277	0	0	0
Cashflows/assets	18,266	0.136	0.086	0.084	0.124	0.18
EBITDA/assets	18,633	0.137	0.083	0.084	0.124	0.175
Ln(assets)	22,339	9.497	1.33	8.555	9.429	10.393
Ln(sales)	17,892	8.903	1.272	8	8.841	9.711
Market-to-book ratio	18,687	2.708	75.348	1.616	2.947	5.337
PP&E/assets	21,721	0.277	0.265	0.068	0.177	0.426
R&D/sales	17,892	0.039	0.104	0	0.004	0.038
Sales growth	17,441	0.06	0.208	-0.009	0.053	0.126
Surplus cash/assets	18,433	0.086	0.09	0.033	0.07	0.127
Ln(total pay)	20,372	14.973	0.872	14.338	14.891	15.566
Salary + bonus	22,344	838444.1	749077.5	500000	650000	951157
Options/total pay	20,374	0.098	0.146	0	0	0.188
Tenure	22,437	4.9	4.9	1	3	7

Table 3: Change in dollar value of delta on ESG contracts inclusion

This table reports coefficient β from a our baseline results in Equation 9:

$$Dollar\ Delta_{e,f,m,a,v,y} = \beta \cdot ESGMetric_{e,f,y} + \alpha_{e,f,m,a,v} + \alpha_y + \epsilon_{e,f,m,a,v,y}$$

For each observation *executive (e)-firm (f)-metric (m)-award type (a)-vesting schedule (v)-year (y)*, we calculate $Dollar\ Delta_{e,f,m,a,v,y}$ in accordance with Equation 8.. $ESGMetric_{e,f,y}$ is a binary variable set to one for *executive-firm-year* observations where executives' compensation contracts include at least one ESG-related metric for that year, otherwise zero. $\alpha_{e,f,m,a,v}$ and α_y represent alternative multidimensional and year fixed effects, respectively. The t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)
		Dollar Delta	
ESGMetric	-4,454.1***	-4,010.6***	-4,403.7***
	(-2.92)	(-2.96)	(-3.28)
Year FE	Y	Y	Y
Executive-Firm FE	Y		
Metric FE	Y		
Executive-Firm-Metric FE		Y	
Executive-Firm-Metric -Award-Vesting FE			Y
Observations	20,929	20,315	20,137
R-squared	0.680	0.725	0.742

Table 4: Change in Dollar Delta after including additional Standard metrics.

This table reports coefficient β from our baseline results in Equation 9, but for standard or non-ESG contracts:

$$Dollar\ Delta_{e,f,m,a,v,y} = \beta \cdot StandardMetric_{e,f,y} + \alpha_{e,f,m,a,v} + \alpha_y + \epsilon_{e,f,m,a,v,y}$$

For each observation *executive (e)-firm (f)-metric (m)-award type (a)-vesting schedule (v)-year (y)*, we calculate $Dollar\ Delta_{e,f,m,a,v,y}$ in accordance with Equation 8.. $StandardMetric_{e,f,y}$ is a binary variable set to one for *executive-firm-year* observations where executives' compensation contracts include at least one additional standard metric for that year. In Column (2), we control for *TotalMetric*, which captures the total count of both ESG and standard metrics assigned to an executive by a firm in a given fiscal year. In Column (3), we show our results from Table 3 for *ESGMetric*, a dummy variable set to one if an executive's compensation contract includes at least one ESG-related metric for that year, after controlling for *TotalMetric*. $\alpha_{e,f,m,a,v}$ and α_y represent alternative high-dimensional and year fixed effects, respectively. The t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)
		Dollar Delta	
StandardMetric	-546.5	-159.2	
	(-0.58)	(-0.16)	
ESGMetric			-4472.6***
			(-2.99)
TotalMetric		-230.7	-58.63
		(-1.59)	(-0.39)
Year FE	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y
Observations	20,003	20,003	20,061
R-squared	0.757	0.757	0.757

Table 5: Effect of E, S, or G Metric Separately

We calculate *Dollar Delta* following the Equation 8. In specification (1), *Dollar Delta* is regressed on *Only E Metric*, a binary variable equal to one for executives whose compensation contracts include only environment-related metrics for that year, but exclude social or governance-related metrics. Similarly, *Only S Metric*, in specification (2) and *Only G Metric*, in specification (3), are binary variables based on the inclusion of exclusively social-related and governance-related metrics, respectively, in the compensation contract. The other variables in specifications (4) through (6) are defined analogously. We remove the sample of observations where an executive has more than one type of ESG metric included in their contracts. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Dollar Delta					
Only E Metric	-7446.8*					
	(-1.89)					
Only S Metric		-4087.3**				
		(-2.43)				
Only G Metric			-727.2			
			(-0.54)			
E or S Metric				-3910.8**		
				(-2.45)		
G or S Metric					-3567.4***	
					(-2.99)	
E or G Metric						-5058.6**
						(-1.98)
Year FE	Y	Y	Y	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y	Y	Y	Y
Observations	12373	15028	12443	17039	15926	12917
R-squared	0.807	0.804	0.807	0.813	0.789	0.764

Table 6: Number of ESG Metric in the Compensation Contract

In specification (1) we regress *Dollar Delta* on *Number of ESGMetric*, a variable that counts the number of ESG metrics included in the executive's compensation in a given year. We calculate *Dollar Delta* in accordance with Equation 8. In specification (2) we add the variable *ESG Metric*, a binary variable set to one for executives whose compensation contracts include at least one ESG-related metric that year. In specification (3) we allow for the number of metrics to change in a non-linear fashion. *One ESGMetric* identifies observations in contracts with a single ESG metric. Analogous definitions apply to *Two-Three ESGMetrics* and *Four or More ESGMetrics*. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)
		Dollar Delta	
Number of ESGMetric	-877.5***	-480.0	
	(-2.78)	(-1.52)	
ESGMetric		-3,803.9**	
		(-2.53)	
One ESGMetric			-2,934.5
			(-1.58)
Two-Three ESGMetric			-7,240.6**
			(-2.46)
Four or more ESGMetric			-8,389.2***
			(-3.77)
Year FE	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y
Observations	20,061	20,061	20,061
R-squared	0.757	0.757	0.757

Table 7: Material ESG Metrics

This table presents the coefficients on our baseline regression (9) augmented with other variables of interest. The variables in the baseline regression are described in Table 3. In specification (1) we include *Only E Material*, a binary variable that takes value of one if, among ESG metrics, only material E-type metrics are included in the contract of that year, and zero otherwise. We define the other variables in the remaining specifications analogously. *Material* is continuous variable at the grant level representing the percentage of ESG performance metrics in a grant that are classified as material based on the SASB Materiality Map. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the *t*-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Dollar Delta			
ESG Metric	-4453.4***	-5387.6***	-4663.6***	-4988.6***	-5475.3***	-4451.8***	-5183.1***
	(-3.24)	(-3.78)	(-3.39)	(-3.50)	(-3.83)	(-3.24)	(-3.58)
Only E Material	-5263.5**						
	(-2.29)						
Only S Material		5439.5***					
		(2.67)					
Only G Material			8365.4**				
			(2.32)				
E or S Material				1761.4			
				(0.85)			
G or S Material					5733.0***		
					(2.81)		
E or G Material						-4968.5**	
						(-2.27)	
E S or G Material							2627.1
							(1.14)
Year FE	Y	Y	Y	Y	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y	Y	Y	Y	Y
Observations	20,061	20,061	20,061	20,061	20,061	20,061	20,061
R-squared	0.757	0.757	0.757	0.757	0.757	0.757	0.757

Table 8: Measurable ESG Metrics

This table presents the coefficients on our baseline regression (9) augmented with other variables of interest. The variables in the baseline regression are described in Table 3. In specification (1) we include *Only E Measurable*, a binary variable that takes value of one if, among ESG metrics, only measurable E-type metrics are included in the contract of that year, zero otherwise. We define the other variables in the remaining specifications analogously. *Measurable* is a continuous variable at the grant level representing the percentage of ESG performance metrics with explicit performance benchmarks. We include multidimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Dollar Delta			
ESG Metric	-4502.7***	-4994.5***	-4697.2***	-4014.1***	-5047.7***	-4665.7***	-4229.9***
	(-3.27)	(-3.60)	(-3.37)	(-2.76)	(-3.58)	(-3.40)	(-2.99)
Only E Measurable	-6035.3**						
	(-2.05)						
Only S Measurable		3223.0**					
		(2.06)					
Only G Measurable			2475.6				
			(1.22)				
E or S Measurable				-3893.0*			
				(-1.65)			
G or S Measurable					2996.8**		
					(2.15)		
E or G Measurable						457.2	
						(0.09)	
E S or G Measurable							-2133.4
							(-1.28)
Year FE	Y	Y	Y	Y	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y	Y	Y	Y	Y
Observations	20,061	20,061	20,061	20,061	20,061	20,061	20,061
R-squared	0.757	0.757	0.757	0.757	0.757	0.757	0.757

Table 9: Robustness to adding firm- and executive-level controls

This table reports coefficients from a our baseline results in Equation 9 in specification (1). We estimate *Dollar Delta* following the Equation 8. *ESGMetric* is a binary variable set to one for executives whose compensation contracts include an ESG-related metric in a given year. In specification (2), we include the firm- and executive- level control variables described in Gormley, Matsa, and Milbourn 2013. In specification (3) we add the contract variables reported in ISS Incentive Lab. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)
		Dollar Delta	
ESGMetric	-4,642.1***	-4,284.5**	-4,110.5**
	(-3.37)	(-2.34)	(-2.24)
Cashflows/assets		-15,157.9	-12,505.7
		(-1.07)	(-0.80)
EBITDA/assets		20,044.6	15,412.3
		(1.37)	(0.98)
Ln(assets)		-7,924.5	-9,046.8
		(-1.22)	(-1.34)
Ln(sales)		4,827.9	5,859.3
		(0.86)	(1.12)
Market-to-book ratio		-1.976	-1.269
		(-0.46)	(-0.29)
PP&E/assets		37,527.5**	51,529.8**
		(1.99)	(2.54)
R&D/sales		49,923.3	29,747.1
		(1.33)	(0.84)
Sales growth		-2,391.9	-2,886.0
		(-0.60)	(-0.75)
Surplus cash/assets		-13,060.8	-11,709.6
		(-1.22)	(-1.06)
Ln(total pay)			22,239.8***
			(7.17)
Salary + bonus			-0.00221
			(-1.07)
Options/total pay			-20,231.6*
			(-1.81)
Tenure			471.1
			(0.17)
Year FE	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y
R-squared	0.757	0.735	0.749
Observations	20,061	14,964	14,009

Table 10: Robustness to other definition of ESG Metric

This table reports coefficients from a our baseline results in Equation (9). We estimate *Dollar Delta* following the Equation 8. *ESGMetric* is a binary variable set to one for executives whose compensation contracts include an ESG-related metric for that year. In specification (1), we use ChatGPT 4o-mini to classify the *metricother* variable from IncentiveLab as either ESG or non-ESG. In specification (2), we rely on the full set of 1,034 words provided in Gantchev, Giannetti, and Hober 2024 to identify ESG contracts. In specification (3), we use the ISS classification to determine ESG contracts; however, because this data is only available since 2018, the sample size is smaller. In specification (4), we extend the ISS classification to earlier years by labeling a contract as ESG if it exactly matches a *metricother* value classified as ESG by ISS after 2018. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)	(4)
			Dollar Delta	
ESGMetric	-3,379.7**	-3,512.5**	-3,099.4**	-2,822.7**
	(-2.40)	(-2.54)	(-2.06)	(-2.05)
ESGMetric Definition	LLM	All Keywords	ISS Classification	Extend ISS Class.
Year FE	Y	Y	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y	Y	Y
Observations	20,061	20,061	15,588	20,061
R-squared	0.757	0.757	0.780	0.757

Table 11: Alternative incentives: Time vested Delta and Total Compensation

We calculate *Time Vested Delta* in accordance with Coles, Daniel, and Naveen 2006 and Core and Guay 2002. *Total Compensation* is the sum of all compensation elements (salary, bonus, and stock and options) provided to an executive. *ESGMetric* is a binary variable set to one for *executive-firm-year* observations where executives' compensation contracts include at least one ESG-related metric in a given year, and zero otherwise. We include executive-firm and year fixed effects. The t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)
	TV Delta	ln(Total Compensation)
ESGMetric	5.202	-0.0108
	(0.34)	(-0.81)
Year FE	Y	Y
Executive-Firm FE	Y	Y
Observations	6,580	13,092
R-squared	0.927	0.897

Table 12: Robustness to extreme number of ESG contracts and restricting sample to recent years

This table reports coefficients from a our baseline results in Equation (9). We estimate *Dollar Delta* following the Equation 8. *ESGMetric* is a binary variable set to one for executives whose compensation contracts include an ESG-related metric for that year. In specification (1), we exclude observations where executives have more than 12 ESG metrics in their compensation contracts, as 12 represents the 99th percentile in our treatment sample. In specification (2), we restrict the sample to years after 2018, as ISS Incentive Lab provides more comprehensive data coverage and improved ESG classification for compensation contracts during this period. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)
	Dollar Delta	
ESGMetric	-4637.8***	-3907.8***
	(-3.37)	(-3.02)
Sample restricted to	less than 13 ESGMetric	after 2017
Year FE	Y	Y
Executive-Firm-Metric-Award-Vesting FE	Y	Y
Observations	19,976	15,588
R-squared	0.757	0.780

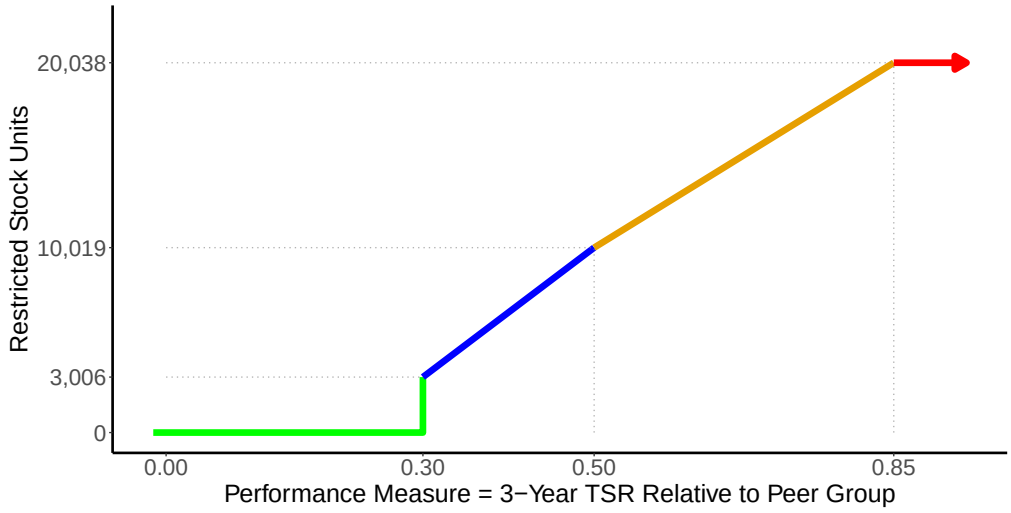
Appendix

A.1 Example of Performance Metrics and Award Structure in Xcel Energy Inc.

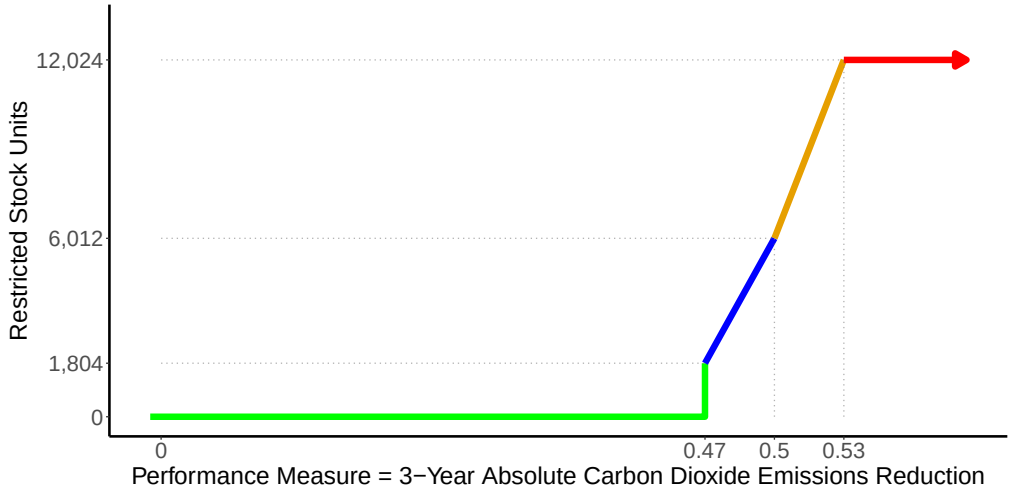
Here, we provide a detailed example of how we calculate different variables in our dataset. We consider a two-metric performance grant awarded to Kent T. Larson, Former Executive Vice President and Group President of Operations at Xcel Energy Inc., for the fiscal year 2020. The grant includes two performance metrics: one based on the firm's total shareholder return (TSR) relative to its peer group (accounting-based) and the other on absolute carbon dioxide emissions reduction (ESG-based), both determining the vesting of restricted stock. The award payout structure specifies, for each metric, the performance metric that triggers vesting, the type of back-end instrument granted upon vesting, the number of units awarded, and the performance period used to evaluate the payout.

Figure A.1 is provided to facilitate the interpretation of the award payout structure for this specific example. The minimum relative TSR required to trigger vesting is 30%, meaning the firm must outperform its peer group by at least 30%. Once this threshold is met, the award amount increases linearly between 30% and 85%, with one slope from 30% to 50% and another from 50% to 85%, after which it remains fixed at 12,024 restricted shares. Figure A.1b illustrates the percentage decrease in carbon dioxide emissions required to trigger the vesting award.

To calculate textitDollar Delta, we first compute delta, which quantifies the change in the expected value of the metric when the stock price increases by 1%, assuming an initial



(a) Accounting-Based Award Payout Structure



(b) ESG-Based Award Payout Structure

Figure A.1: Award Payout Structures

stock price of 1. We apply the approach of Bettis et al. 2018 [12]. The simulation approach focuses on performance-vesting awards, where vesting depends on either stock performance or an accounting performance metrics. A Monte Carlo simulation models the evolution of accounting and stock price performance over the performance period, assuming that accounting metrics follow an arithmetic Brownian motion and stock prices follow a geometric Brownian motion. We estimate volatility and correlation between these factors

[12]We thank the authors for generously sharing their simulation code with us.

using historical firm-level data. For each simulated path, the number of shares that vest is determined by the payout schedule, and the present value of the award is computed within a risk-neutral framework.[13]

In this case, delta is calculated as 0.02. The textitPercent Vest is equal to one, meaning the measurement period is not divided into several periods. Given that the closing stock price was \$62.38 as of January 2, 2020 (grant date) and the target number of shares was 10,019, the textitDollar Delta is calculated as $62.38 \times 10{,}019 \times 1 \times 0.02 \approx 12{,}500$, meaning that if the stock price increases by one percent, the executive earns 12,500 more dollars due to this metric.

As there is only one ESG metric in this grant and three benchmarks at which the ESG metric triggers vesting, the value for Measurability is equal to 1, indicating that all ESG metrics in this grant are measurable. Moreover, according to the SASB Materiality Map, "GHG emissions" are material for companies in the "Electric Utilities & Power Generators sector". As a result, Materiality is also equal to 1, indicating that all ESG metrics in this grant are material.

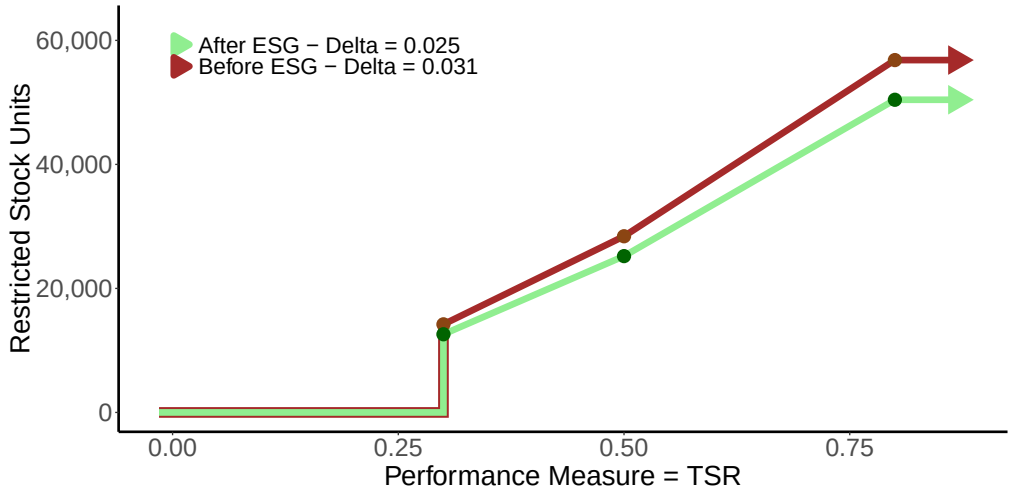
A.2 Example of introducing an ESG Metric to a Non-ESG grant and its effect on delta

In 2019, Paul S. Herendeen, Executive Vice President and Chief Financial Officer of Bausch Health Companies Inc., had only non-ESG metrics, such as Total Shareholder Return (TSR), EBIT, and Gross Revenues, included in his compensation grant. In 2020, a social metric from the Employee Engagement, Diversity & Inclusion category was introduced to his grant. In Figure A.2, the change in the pay structure related to the TSR metric is illustrated. It can be seen that while the benchmarks triggering vestings remain unchanged, the amount paid at

[13] For a more detailed explanation, refer to Appendix 1 of Bettis et al. 2018.

the same performance level is modified; as a result, the delta decreased from 0.031 to 0.025.

Figure A.2: Comparison of the delta in a performance metric before and after the introduction of an ESG metric in the 2019 compensation package of Paul S. Herendeen, Executive Vice President and Chief Financial Officer of Bausch.



A.3 ESG Words

The following is the list of 953 words from Gantchev, Giannetti, and Hober 2024 we used to classify compensation contracts as ESG related:

AAIR, abatement, abating, Aboriginal, ACCC, accessible, accident, accidents, adopt, adverse, affordability, affordable, AFR, African, aid, AIFR, air, AIRR, alarms, all-electric, all-employee, all-injury, AML, animal, anti-money, antibias, antibribery, anticorruption, antidumping, antimicrobial, antiracist, antislavery, antitrust, arsenic, ASAOC, assault, assistance, assisting, atmosphere, attitude, attitudes, audit, auditing, auditors, authority's, avoidable, avoidance, awareness, AWRCR, B-BBEE, BaCE, BAIR, BAME, BEE, behaving, behavior, behavior-based, behavioral, beneficial, BIFR, bio, biodiversity, biofuel, biomass, biosecurity, BIPOC, black, breach, breaches, BREEAM, bribery, BSEE, bullying, bushfire, CAHPS, carbon, carcinogens, caseload, catastrophic, catchment, CCUS, CCV, CDC, CDIs, CDP, CE marking, Celsius, censure, certificates, certification, certifications, certified, CFC,

CG, CGA, chargeable, charitable, charities, charity, CHESM, child, CIFR, CIGS, circular, circularity, citizenship, clean, cleaner, cleantech, climate, climate-positive, climate-related, climates, climatic, CMVI, CNMC, CO, CO2, CO2 emission, CO2 reduction, CO2-equivalent, CO2-reduced, CO2e, CO2eq, coal-based, coal-exit, collaborate, collaborative, collaboratively, collaborators, colleague, colleagues, collision, collisions, color, colored, commit, committed, committing, communities, community, community-backed, commuting, complex-recycling, compliance, compliances, compliantly, complying, compostable, concerns, conflict, conflicts, conservancy, conservation, consumed, consumption, contaminated, contamination, cooperation, COP21, CORESafety, corporate social responsibility, corrupt, corruption, coworker, CPMM, CRD, Cree, CRI, criticality, CSA, CSAP, CSR, CTF, cultivate, culture, CVIR, CWI, DI, damage, damages, danger, dangerous, DART, Days Away Restricted Time, deadly, deaths, decarbonization, decarbonized, DEI, demographic, demographics, derailments, dielectric, diesel, DIFR, dioxide, DIR, disability, disaster, discrimination, disposals, disturbance, diverse, diversity, DJSI, DJSIW, DOJ, donations, DOT, drops, e-buses, e-trucks, e-waste, EACC, eco, eco-design, eco-efficient, eco-labeled, ecological, ecologically, ECOLOGO, EcoVadis, educate, educating, education, educational, EEAFR, EHS, EHS-related, EHSS, EI, EIA, EIR, elearning, electricity, electrification, ELMUS, ELWG, EMAS, emergencies, emergency, emission, emissions, emitted, empathetic, employability, employee, employee-based, employee-evaluation, employee-initiated, employee-led, employees, employer, employers, employment, energies, energy, engage, engaged, engagement, engages, engaging, engender, enjoyable, ENSR, environment, environment-linked, environmental, environmental-related, environmentally, environmentally-friendly, environments, EOS, EPC, equality, equitable, ergonomic, ERIF, ESCG, ESCMP, ESE, ESG, ESG reporting, ESG targets, ESG-criteria, ESG-dedicated, ESG-integrated, ESG-oriented, ESG-related, ESPC, Ethibel, ethic, ethically, ethics, EthiFinance, ethnic, ethnically, ethnicity, EV charging, EXI, fair, fairly, fatal, fatalities, fatality, fatigue, fatigue-violation, FCA, FCPA, female, female-owned,

females, feminization, feminizing, fiduciary, FIR, fire, fire-related, fires, Fitwel, flooding, FOFA, food, footprint, footprinting, forest, forestry, FOS, foster, fostering, fosters, freedom, frequency, freshwater, FSI, FTSE4Good, FVR, GAIA, Gallup, Gallup's, gaps, gas outages, GCA, gCO2, gCO2e, GDPR, GED, gender, Gender-Equality Index, GHG, GHG-related, GHGE, GMDSS, GMP, GMP-compliant, GMP-ready, GMR, governance, GPG, green, greener, greenhouse, greening, GRESB, GRI, GSCOP, GWh, GxP, HACT, happier, happiness, harassment, harm, harmful, harms, hazard, hazardous, hazards, HCAHPS, HDSA, HDSAs, health, Health-e Workforce Solutions, healthcare-associated, healthier, healthy, heat, help, helped, helping, HES, HESS, high-hazard, high-severity, HIPAA, HIRR, HIV, HMDA, hospice, hospitality, hospitalization, house, housing, HPI, HPIFR, HPIs, HPN, HQE, HRA, HRI, HSE, HSEC, HSEIP, HSEMS, HSEQ, HSER, HSES, HSMSO, HSS, HSSD, HSSE, HSSEC, HSSEQ, HTA, human, human-resource, human-resources, humanitarian, humanity, hygiene, ICAM, IDEAL, IIR, illegal, illness, illnesses, impact, impacting, impacts, incidence, incidences, incident, incident-based, incidents, inclusion, inclusion-related, inclusiveness, inclusivity, Indigenous, infractions, inhalable, injuries, injury, Innu, inpatient, inspires, integrity, intensity, interpersonal, Inuit, involvement, IOSA, ISNetworld, ISO-compliance, ISP, ISS ESG, ISS ESG rating, ISS-oekom, JCI, job-safety, jobs, JSEA, justice, kCO2, kgCO2, kgCO2e, kids, kWh, KYC, L6, landfill, landscape, Latinx, laundering, lawfully, LDAR, leader, leaders, leadership, leakage, leaks, LEED, legislation, LFTR, LGBTQ, life-changing, life-enhancing, LifeSkills, literacy, litigations, livelihood, lives, LMICs, LOCIs, LOPC, lost, Lost-Time, low-carbon, low-emission, LTAFR, LTAR, LTAs, LTDIF, LTFIR, LTIF, LTIFR, LTIIR, LTIR, LTIs, LTIS, LTISR, LWCR, LWDIR, LWDR, MAIFI, malaria, males, managers, materiality, maternal, Mecheshoo, Medicaid, medically, men, mental, mentality, mentor, mentoring, mentorship, methane, microplastics, middle-income, migrant, minorities, minority, mitigating, mitigation, MMTCO2e, monitor, morale, morbidity, mortality, MOSWEC, motivated, motivating, MSHA, MTIFR, multicultural, multiracial, MVI, NABERS, nationality, native, near-miss,

NECEC, neighborhoods, net-zero, neutralize, newborn, NFDL, noise, noise-related, non-compliance, non-compliances, non-compliant, non-discrimination, non-emitting, non-fatal, non-fresh, non-hazardous, non-injury, non-renewable, non-reportable, non-white, norms, NQS, nurture, nurturing, occupational, ODMs, odor, Ofcom, offset, offsets, offsetting, Ofwat, OHC, OHES, OHI, OHSAS, OHSE, OII, oil-to-gas, ombudsman, ORIR, OSHA, OSHA-recordable, outpatient, OWL, P1, palm, parental, passion, patient, patient-centric, patient-focused, peatland, people, people-based, peoples, personnel development, PHC, PHEV, philanthropic, philanthropy, photovoltaic, physician, planet, plant-based, planting, plastic, plastics, PLMUS, PLWG, PM10, PMVA, PMVAR, policies, policy, policymaker, pollution, pollutions, population, populations, positivity, potable, poverty, POW, prejudice, preventable, preventative, prevention, preventive, prosecution, prosper, protected, protecting, PSER, PSEs, PSIR, PSIs, PSPS, psychologically, PUE, PV, PVAR, PVIR, QHSE, QHSES, QualityScore, race, racial, racialized, RCFR, RCR, recordable, recordables, recruit, recruiting, recyclability, recyclable, recycle, recycled, recycling, reduce, reduction, reductions, refuel, regeneratively, regime, regulation, regulations, regulator, regulatory, rehab, rehabilitate, rehabilitated, rehabilitation, rehospitalization, reliance, remotely, removals, renewable, replacements, represented, resilience, resilience-based, resilient, reskilling, resource, resources, resources-related, respecting, respects, responsibilities, responsibility, responsible, responsibly, retention, retirees, retraining, reusable, reusables, reuse, reused, RGMP, Ribbon, RICI, RIDDOR, RIDDORs, RIF, RIFR, rights, RightShip, RIR, Robeco, RobecoSAM, rPET, RSE, RVIR, SACIFR, SAF, safe, safeguarding, safer, safety, safety-first, safety-related, SAIDI, salary, saltwater, SAM, sanitation, Sapin, Sarbanes-Oxley, SASB, satisfactory, satisfied, SBTi, SBTi-approval, SCFR, science-based, scope, scopes, secrecy, SEEC, SEIFR, self-care, self-development, serious, severity, sexual, SF6, shared-value, SHECR, SHECS, SHS, sick, sickness, SICR, SIF, SIFR, sinks, SIP, slates, slavery, SLO, smallholder, SMCR, SO2, social, social health, social-economical, socially, societal, societies, society, society's, socioeconomic,

soil, solidarity, SOX, SOX deficiencies, SOX-compliant, species, spill, spilled, spills, SPMVI, SSOFR, StakeholderWatch, STARR, statutorily, stewardship, stress, succession, suicide, supervisors, supplied, support, supported, supportive, supports, surveillance, SustainAbilities, sustainability, sustainability-based, sustainability-labelled, sustainability-linked, sustainability-related, sustainable, sustainable-development, sustainably, Sustainagility, Sustainalytics, SWD, tailings, tails, talent, talents, TAR, taxonomy, TCEQ, TCF, TCFD, TCIR, tCO2, tCO2e, team, teambuilding, teammate, teams, teamwork, teamworking, TFAF, TFIR, thriving, TICR, TIFR, TIR, traceability, traceable, TRAFR, training, trainings, transparency, TRCF, TRCFR, TRCR, treatable, treating, trees, TRER, TRFIR, TRI, TRIF, TRIFR, TRIR, TRR, trustworthiness, trustworthy, TSM, TTIFR, UN, underrepresented, underserved, unionized, unions, unsafe, upcycling, upskilling, urgency, value-based, values, values-based, vegetation, veteran, veterans, Vigeo Eiris, violation, violations, VIR, VOCs, VoE, voluntary turnover, volunteered, volunteering, volunteerism, vulnerable, WACI, warming, waste, wastes, wastewater, water, water-intensive, waters, watershed, ways-of-working, welfare, wellbeing, wellness, whistleblowing, WHS, wildfire, wildflower, wildlife, WLO, WLTP, woman, women, women-owned, women's sponsorship, womenÄôs, woodland, work, work-related, workday, workdays, worked, worker, workforce, worklife, workload, workplace, workplaces, worksite, worst, young, youth, zero-carbon, zero-fatalities.

A.4 Examples of excluded words

Below we show examples of few words we exclude from Gantchev, Giannetti, and Hober 2024 word list. We exclude these words, since the fraction of correctly identifying ISS classified ESG metricother was less than 0.5.

Table A.1: Examples of excluded words: Complaint

metricother	ESG Comp. Metric
Customer Complaint	0
On-time complaint quality reporting	0
Complaint Tracking Module Volume per 1,000 members per month	0
Complaint Management	0
Complaint Timeliness Execution	0

Table A.2: Examples of excluded words: Cyber

metricother	ESG Comp. Metric
Cyber Mindset results for Finance and Corporate Development departments	0
Cyber Mindset results	0
Cyber Mindset results for US Markets	0
Technology and Cyber Risk Management	0

Table A.3: Examples of excluded words: Trust

metricother	ESG Comp. Metric
Execution of The Trust's Capital Plan	0
Trust and Brokerage as Measured Against Their Combined Goals	0
Composition of Trust's Portfolio	0
Merck Trust & Value Customer Survey	0
MS Leader in Customer Trust and Value Survey	0
Wells Fargo Institutional Retirement Trust Integration Scorecard ...	0
MS Leader in Customer Trust and Value Survey	0
Enhance customer trust by achieving targeted product safety ...	0
Performance of Commerce Trust	0

A.5 Examples of ESG Metrics in Executive Compensation

Table A.4: Examples of ESG Metrics in Executive Compensation

This table presents selected environmental, social, and governance (ESG) metrics commonly used in executive compensation.

Environmental	**Social**	**Governance**
Food Waste	Employee Retention	Ethics Compliance
Wildfire Plan	Diversity	Cybersecurity
Zero Waste	Safety Training	Succession Plan
Water Recycling	Women in Leadership	Capital Use
Plastic Reduction	Incident Rate	Regulatory Goals
Renewable Energy	Client Retention	Internal Controls
Carbon Market	Fair Hiring	Public Policy
Water Savings	Community Work	Board Diversity
Emission Cuts	Workplace Safety	Anti-Corruption
Green Buildings	Employee Satisfaction	ESG Reporting
Methane Reduction	Equal Pay	Risk Management
Carbon Intensity Cut	Health & Safety	Corporate Transparency
Net Zero Goals	Labor Rights	Shareholder Rights

A.6 Examples of Measurability and Materiality of ESG Metrics

Table A.5: Examples of Measurability and Materiality of ESG Metrics

This table presents examples of ESG metrics in our dataset. The Measurable column indicates whether a given metric has explicit performance benchmarks (1) or not (0). Since the materiality of an ESG metric depends on the industry, we include in the Industry column one SASB industry category where this metric appeared in at least one executive's grant. The Material column specifies whether the ESG metric is considered material in that industry (1) or not (0).

Metric	ESG Category	Measurable	Industry	Material
Cumulative Carbon Emissions Reduction	Environmental	1	Electric Utilities & Power Generators	1
Sustainability - Air Travel	Environmental	1	Software & IT Services	0
Climate Change	Environmental	0	Road Transportation	1
Progress toward our long-term sustainability goals	Environmental	0	Restaurants	0
Low-carbon Investments as a Percent	Environmental	1	Oil & Gas – Refining & Marketing	1
Carbon Footprint Goal	Environmental	1	Medical Equipment & Supplies	1
Fatalities	Social	1	Meat, Poultry & Dairy	1
Safety Performance (Measured in ORIR)	Social	1	Water Utilities & Services	1
Safety	Social	0	Metals & Mining	1
On-Site Team Engagement, Retention	Social	0	Real Estate	0
Diversity Index Scores	Social	1	Asset Management & Custody Activities	1
Succession Planning	Governance	0	Real Estate	0
Achieve the Reliability System Average	Governance	1	Electric Utilities & Power Generators	1
Ethics	Governance	0	Biotechnology & Pharmaceuticals	1
Supporting Our Corporate Ethics Program	Governance	0	Software & IT Services	0
Legal Client Support	Governance	0	Electric Utilities & Power Generators	0

Table A.6: Change in the pay-performance elasticity or delta on inclusion of ESG metrics

This table reports coefficient β from a our baseline results in Equation 9:

$$Delta_{e,f,m,a,v,y} = \beta \cdot ESGMetric_{e,f,y} + \alpha_{e,f,m,a,v} + \alpha_y + \epsilon_{e,f,m,a,v,y}$$

For each observation *executive (e)-firm (f)-metric (m)-award type (a)-vesting schedule (v)-year (y)*, we calculate $Delta_{e,f,m,a,v,y}$ in accordance with Bettis et al. 2018. $ESGMetric_{e,f,y}$ is a binary variable set to one for *executive-firm-year* observations where an executive's compensation contract includes at least one ESG-related metric in a given year. $\alpha_{e,f,m,a,v}$ and α_y represent alternative high-dimensional and year fixed effects, respectively. The t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)	(3)
		Delta	
ESGMetric	-0.00114	-0.00186**	-0.00202**
	(-1.24)	(-2.05)	(-2.17)
Year FE	Y	Y	Y
Executive-Firm FE	Y		
Metric FE	Y		
Executive-Firm-Metric FE		Y	
Executive-Firm-Metric -Award-Vesting FE			Y
Observations	20,831	20,234	20,061
R-squared	0.432	0.464	0.472

Table A.7: Effect on Accounting and Financial Metric Separately

We calculate *Dollar Delta* following the Equation 8. In specification (1), we restrict our sample to only accounting metrics including: EBIT, EBITDA, EPS, Earnings, Net Income, Operating Income, and Sales. In specification (2), we restrict our sample to only financial metrics including Stock price and Total shareholder returns. We include high-dimensional *executive-firm-metric-award type-vesting schedule* and *year* fixed effects in all regressions. In all specifications, the t-statistics, in parentheses, are based on standard errors clustered at the executive level. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	(1)	(2)
	Dollar Delta	
ESGMetric	-5704.2*	-4019.2***
	(-1.96)	(-2.91)
Metric Type	Accounting	Financial
Year FE	Y	Y
Executive-Firm-Metric -Award-Vesting FE	Y	Y
Observations	6,828	13,233
R-squared	0.627	0.795