

# Human Capital Metrics and CEO Pay

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## Abstract

Using a hand-coded sample of over 45,000 CEO compensation performance plans from 1998 to 2023, we conduct a pioneering analysis of the use of human capital-based (HC) performance metrics in CEO pay. In our sample, HC plan adoption grew from 4% of firms in 1998 to 57% in 2023, with the associated pay value rising from about 0.1 times salary to more than 1.8 times salary. Firms with larger workforces and higher reliance on human capital are more likely to adopt HC plans and grant higher pay values under these plans. Investor preferences appear to have contributed to observed waves of HC plan adoption. CEOs with HC plans based on diversity, equity, and inclusion (DEI) metrics, qualitative measures, or multiple metrics and metric types receive significantly higher short-term incentive pay without delivering better financial performance. These patterns raise concerns about agency problems in firms that adopt HC metrics that are inherently difficult for shareholders to monitor. Overall, our findings challenge the common practice of lumping E, S, and G performance metrics together and highlight the need to examine each type of incentive metric separately.

*JEL Classification: M12; M14; G30; J24*

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# Human Capital Metrics and CEO Pay

## 1. Introduction

Becker's (1964) seminal work identified human capital as a factor generating productivity and profitability for firms. Yet historically, it has been uncommon to find human capital-based metrics included in executive compensation plans. As we document here, recently this has begun to change. This change potentially aligns with both the rising importance of human capital in firms (e.g., Zingales, 2000; Autor et al., 2003; Deloitte, 2024) and expressed changes in investors' priorities. Regarding the latter, in 2017, a group of institutional investors that collectively managed over \$2.8 trillion in assets petitioned the SEC to increase human capital management disclosures (Human Capital Management Coalition (HCMC), 2017). In 2020, the SEC added a new rule to Regulation S-K amendments which mandates that U.S. public companies describe their human capital resources in annual reports (Form 10-K). Yet, to date, we know little about when and how human capital metrics are used in executive pay (e.g., Flammer et al., 2019).

More generally, corporate governance and compensation experts have documented a recent increase in the use of non-financial metrics in compensation plans. A specific focus has been on the use of environmental, social, and governance (ESG) measures.<sup>1</sup> While there is consensus regarding this trend, there is disagreement as to why it is occurring. Some point to external forces such as societal expectations (Cohen et al., 2023), investor preferences (Dikolli et al., 2023; Wiersema and Koo, 2022), and regulatory pressure (Carter, Pawliczek, and Zhong, 2023; Kimbro and Xu, 2016). Others emphasize internal forces such as employee activism (Foss and Klein, 2023) or managerial rent-seeking (Hong, Li, and Minor, 2016).

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<sup>1</sup> See for example, Cai, Jo, and Pan, 2011; Flammer, Hong, and Minor, 2019; Geczy, Jeffers, Musto and Tucker, 2021; Tsang, Kang, and Yang, 2021; Bebhuk and Tallarita, 2022; Hazarika, Karpoff, Nahata, 2022; Cohen et al., 2023b; Rajan, Ramella, and Zingales, 2023; Badawi and Bartlett, 2024; Gantchev, Giannetti and Hober, 2025.

We contribute to the literature by providing a pioneering analysis of the use of human capital-based (HC) performance metrics in CEO pay, which encompass measures tied to attracting, retaining, and developing the workforce. This research focus allows us to develop sharper hypotheses and conduct more targeted empirical analyses, whereas prior studies often lump environmental, social, and governance metrics together and emphasize environmental metrics, despite meaningful differences in their nature, implications, and the firm outcomes they affect.

There is ongoing and vigorous disagreement over whether performance based on non-financial metrics, such as human capital, should be a component of at-risk CEO compensation. On the one hand, if effective human capital management is associated with stronger financial outcomes, incentives based on financial performance should motivate managers to effectively manage human capital (e.g., Bloomfield, Bourveau, Lin, She, and Zhu, 2025). Put differently, under an efficient contracting framework, there would be no need to explicitly compensate for human capital performance. Indeed, critics argue that paying for ESG performance is associated with inadequate corporate governance (Badawi and Bartlett, 2024), unfairly privileges some stakeholders over others (Bebchuk and Tallarita, 2022), adds unnecessary complexity to contracts (Albuquerque et al., 2025; Burkert et al., 2024), and undermines financial performance (Homroy, Mavruk, and Nguyen, 2023).

On the other hand, specifically calling out human capital management as something for which executives are held accountable can have powerful signaling effects and be a relatively inexpensive way for firms to broadcast human capital-related commitments (Cohen et al., 2023b). Indeed, supporters emphasize the expanded role of the corporation in society, the importance of broader societal goals, and the need to prioritize stakeholders beyond shareholders (Magill, Quinzii, and Rochet, 2015; Flammer et al., 2019).

Against this backdrop, we ask why firms explicitly embed HC metrics in CEO compensation and how these metrics translate into pay and incentives. We examine whether the use of HC metrics in CEO compensation is more consistent with efficient contracting versus agency costs and executive rent-seeking. We also explore whether the uptick in HC plans can be explained by the rising importance of human capital in firms (e.g., Zingales, 2000; Autor et al., 2003; Deloitte, 2024), and/or by recent shifts in investor preferences (e.g., HCMC 2017; ISSB, 2025). To address these questions, we (i) document the design and evolution of HC plans, (ii) analyze the firm characteristics and investor preferences associated with their adoption, (iii) quantify the pay values tied to HC plans, and (iv) assess the relationship between HC plan adoption and subsequent financial performance. To our knowledge, we are the first to analyze HC plans in such a detailed and comprehensive way. Our approach responds to Starks's (2023) call for more granular analysis of firms' individual E, S, and G policies.

Our sample consists of 45,585 CEO performance plans adopted between 1998 and 2023 by 1,866 large publicly traded U.S. firms. We categorize each plan as an HC or non-HC plan by manually coding through the nearly 11,000 variations of non-financial metrics included in these plans. A plan is classified as HC if at least one of its performance metrics pertains to the firm's human capital. Other plans are classified as non-HC. We further classify HC plans into three types: (i) employee health and safety (HS) plans, (ii) diversity, equity, and inclusion (DEI) plans, and (iii) talent and culture (TC) plans.

First, we provide a detailed description of HC plans and their evolution over time. Across all sample plans, 12.3% are HC plans, with 20.3% of sample firms (48% after 2017) adopting an HC plan at least once. In contrast, other ESG metrics are included in only 3.9% of performance plans. This difference underscores the prevalence of HC metrics relative to other types of ESG

metrics. In terms of time trends, the percentage of firms granting HC plans rises gradually from 4% in 1998 to 17 % in 2017, then jumps to 41 % in 2018 (driven largely by new TC plans) and to 52 % in 2021 (driven largely by new DEI plans). The timing of these jumps aligns with the 2017 Human Capital Management Coalition petition and the 2020 SEC rule change. This pattern is consistent with Edmans, Gosling, and Jenter's (2023) argument that boards adjust executive compensation design in response to pressure from stakeholders and the public.

HC plans appear in every industry, and in most industries more than half of the firms have adopted them at least once. Interestingly, industries with low and high adoption rates include both labor- and capital-intensive industries. This suggests that a firm's use of human-capital metrics is influenced by factors beyond traditional considerations of labor or capital intensity. We also code each metric to distinguish between quantitative and qualitative targets. A quantitative metric specifies a numerical target, while a qualitative metric lacks a quantifiable hurdle and is explained using descriptive language. Overall, 62% of HS plans use quantitative metrics, compared with 43% of DEI plans and fewer than 18% of TC plans. The use of quantitative metrics increases over time, reaching 80% for HS plans, 59% for DEI plans, and 21% for TC plans by 2023.

The average dollar value of HC plans increases from \$91,000 in 1998 to \$2.3 million in 2023. As a multiple of CEO salary, plan values grow from around 10% of salary in 1998 to over 180% salary in 2023. Similar to the pattern of HC plan adoption, plan values show two distinct jumps: a 17% increase after 2017 and an additional 2.4% increase after 2020. Plan values grow over time for all three types of HC plans, with DEI plans experiencing the largest increase.

Second, we conduct regression analyses to understand the characteristics of firms that adopt HC plans and how adoption is associated with investor perspectives and preferences. Our choice of determinants is guided by matching theory (e.g., Gabaix and Landier, 2008) and

incentive contracting theory (e.g., Jensen and Meckling, 1976; Holmstrom, 1979). Gabaix and Landier (2008) posit that the most talented executives are paired with the largest firms, and their pay therefore rises in proportion to firm size. Building on this logic, we hypothesize that CEOs with stronger human capital management capabilities will be matched with firms with larger stocks of human capital (i.e., workforces). These firms, in turn, are more likely to incorporate HC metrics into CEO performance plans to reward the productive use of that talent.

Incentive theory suggests that CEO pay should be tied to observable outcomes to align managers' incentives with shareholders' interests (e.g., Jensen and Meckling, 1976; Holmstrom, 1979; Jensen and Murphy, 1990). Firms with strong financial performance may see little need to add non-financial HC metrics to their CEO compensation plans. Cheng, Hong and Shue (2023) also show that CEOs whose pay is more tightly linked to stock performance are less likely to spend on ESG or CSR (Corporate Social Responsibility) initiatives. By contrast, firms with weaker financial performance may be more inclined to adopt HC metrics either to keep CEO pay competitive for retention or because better human capital management has been identified as an area for improvement. Accordingly, we hypothesize that the likelihood of adopting HC plans will be negatively related to firm financial performance.

Holmstrom (1979) further argues that when a CEO is responsible for multiple dimensions of firm performance (e.g., financial performance and human capital management), tying CEO pay to a broader range of observable outcomes can better align the CEO's incentives with the firm's objectives and reduce the risk of distorted incentives. Moreover, if human capital is a key long-term value driver for firms, as argued by Becker (1964), incorporating HC metrics into CEO incentive contract would guide CEOs to focus on this value-enhancing mechanism. Based on these

arguments, we hypothesize that firms in which human capital is more important to performance and value are more likely to adopt HC plans.

Our dependent variable is an indicator variable equal to one if a firm adopts an HC plan in a particular year and zero otherwise. Explanatory variables are grouped into four categories: firm characteristics, firm financial performance, human capital importance, and investor influence. Firm characteristics alone explain about 17% of the variation in HC plan adoption. Adding firm financial performance only slightly increases the model's explanatory power, while including measures of human capital importance raises it by about 10%. Loadings on explanatory variables are consistent with our hypotheses: the likelihood of adopting an HC plan is positively related to human capital importance and negatively related to financial performance. Consistent with investor influence, the jumps in HC plan adoption in 2018 and 2021 are statistically significant in the multivariate setting, and firms are more likely to adopt HC plans following weaker Say-on-Pay vote support. Adding industry fixed effects increases the exploratory power of the determinant model by another 28%-44%, depending on the specification, and in these models the influence of workforce is size significantly positive. This suggests that within an industry, firms with relatively large stocks of human capital are more likely to adopt HC plans.

We also analyze the likelihood of plan adoption separately for each type of plan vis-à-vis firms that do not adopt any HC plan. Across plan types, workforce size, human capital importance, and post-2017 and post-2020 indicators are consistently positively associated with plan adoption, while SOP votes support is consistently negatively associated with plan adoption. To complement the likelihood analysis, for the subset of firms using HC plans, we examine the determinants of the magnitude of HC plan values as a multiple of CEO salary. We again find that workforce size and human capital importance, and the post-2017 indicator are consistently positively associated with

HC plan values. Collectively, these findings confirm human capital importance and shareholder influence as key determinants of both HC plan adoption and plan value.

Third, we explore how HC plans relate to CEO pay and firm performance. We first examine whether CEOs with at least one HC plan receive higher pay than those with only non-HC plans. Because 95% of HC plans are short-term, we examine total CEO short-term incentives expressed as a multiple of CEO salary. Overall, the size of CEO short-term incentive pay does not differ for firms with HC plans and those without. However, we find significantly higher short-term incentive pay when plans include qualitative DEI metrics, multiple DEI metrics, or when multiple types of HC metrics are used. These results raise concerns regarding agency costs, since the pay increases arise only in plans that rely on measures that are inherently more difficult to monitor and evaluate.

We next examine the relation between HC plans and subsequent financial performance. Specifically, we compare the post-adoption financial performance of firms with HC plans to that of firms without HC plans. Our findings are consistent with the literature, which generally finds no relation between the adoption of ESG-based compensation and firm financial performance (e.g., Homroy et al., 2023). Although overall performance is similar for firms with and without HC plans, DEI plans are associated with weaker performance in some analyses. These findings reinforce agency-cost concerns, as these CEOs receive higher short-term pay without corresponding performance improvements, particularly under plans that are hard for shareholders to monitor.

Overall, our findings underscore the need for directors and investors to carefully examine the design of HC plans. While the adoption of HC metrics generally reflects the growing importance of human capital and aligns with investor preferences, our evidence also points to the complexity and nuances in the design and implementation of these plans. Certain plan features



such as qualitative DEI metrics and the use of multiple metrics or metric types may be associated with agency concerns.

Our paper contributes to the long-standing literatures on CEO incentives and pay (e.g., Jensen and Meckling, 1976; Jensen and Murphy, 1990) and on the role of human capital in driving firm value and competitive advantage (e.g., Becker, 1964; Berk, Stanton, Zechner, 2001; Carlin and Gervais, 2009; Chemmanur, Cheng, and Zhang, 2013; Eisfeldt and Papanikolaou, 2013; Zingales, 2000). Further, while prior studies of executive pay focus mainly on financial performance, and studies of human capital stress its role as a driver of value, our paper bridges these literatures by showing that the rising importance of human capital in the economy is reshaping the design of executive compensation.

Our paper also adds to the emerging literature on the SEC's mandated human capital disclosures (Bourveau et al., 2023) and their impact (e.g., Regier and Rouen, 2023; Arif, Banker, and Wasley, 2023; Mayew and Zhang, 2024). This line of research highlights the growing demand for transparency around human capital management. We extend these insights by showing that firms go beyond disclosure to embed human capital metrics directly into executive compensation contracts, a channel through which investor pressure and regulatory changes can shape managerial incentives.

## **2. Sample Construction and Data**

### *2.1. Sample construction*

Our sample contains 45,585 CEO performance plans granted between 1998 and 2023 from the ISS Incentive Lab dataset using absolute performance metrics.<sup>2</sup> We obtain plan participant

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<sup>2</sup> We exclude relative performance plans as ultimately only 127 (1%) of the 12,410 relative performance plans in the ISS Incentive Lab dataset use HC metrics of any kind.

information from the participant data table, performance metrics details from the absolute performance goals data table, plan-level horizon and value information from the plan-based awards table, and firm-year compensation variables (salary, bonus, etc.) from the summary compensation table. Depending on its design, a performance plan can include multiple performance metrics or goals, which may be assessed over different time periods. Most CEOs have multiple performance plans outstanding in a single year.

Firm financial data are obtained from the CRSP/Compustat merged database, institutional holdings from the Thomson Reuters Institutional (13f) Holdings database, and SOP voting outcomes from the ISS Voting Analytics database. After imposing a requirement of non-missing annual data for return on assets, stock returns, and total assets, our final sample includes 22,053 firm-year observations for 1,866 unique firms.

## *2.2. Classification of human-capital (HC) based performance plans*

We begin by creating a list of unique non-financial performance metrics utilized in our sample of performance plans. We do a preliminary grouping of metrics into financial and non-financial based on the ISS Incentive Lab variable “metrictype,” classifying metrics as non-financial for values equal to “CSR”, “Environment”, “Non-Financial”, “Social”, or “Other”. We then manually review the description of each non-financial metric that is contained in the ISS variable “metricother”. Through this process, we identify 10,853 unique, non-financial performance metrics.

To identify HC plans, we manually review each of the 10,853 non-financial metrics following the procedure outlined in Appendix A. Once a metric is classified as HC, we further classify it into one or more of three non-mutually exclusive HC sub-categories — health and safety (HS), diversity, equity and inclusion (DEI), and talent and culture (TC) — using the

“metricother” variable, which contains proxy-statement excerpts that describe the relevant performance metric.<sup>3</sup> To classify a metric as HS, DEI, or TC, the “metricother” field must contain at least one of the relevant keywords described in Appendix A, subject to some exceptions as noted. After the HC categories are assigned, we tag all remaining non-financial metrics as Other ESG or miscellaneous as described in Appendix A.

We also classify each metric as either quantitative or qualitative based on the Incentive Lab variables “metrictargetvalue”, “metricgrowthvalue”, and “metricother.” A quantitative metric specifies a clear numerical target, such as achieving “workforce diversity of 60.6%” (Verizon Communications, 2023 DEI plan). In contrast, a qualitative metric lacks a quantifiable hurdle and is explained using descriptive language, such as “improve safety and resiliency capabilities” (Edison International, 2021 HS plan). A preliminary classification is constructed based on “metrictargetvalue” and “metricgrowthvalue” — if either of them is non-missing, the metric is classified as quantitative. This is insufficient, however, as firms are not required to disclose metric details and many choose not to do so, for example, to protect proprietary information. Thus, for all metrics initially classified as qualitative, we screen “metricother” for keywords that indicate the use of a quantitative metric, such as “measure”, “reduction”, “index”, “record”, “rate”, and “result”, and manually review all remaining unclassified metrics (see Appendix A).

We classify a plan as an HC plan if it uses at least one HC metric. A plan is classified as an HS, DEI, or TC plan if at least one plan metric falls into the relevant category. Similarly, an HC (HS, DEI, or TC) plan is classified as quantitative if it uses at least one quantitative HC (HS,

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<sup>3</sup> As an example of why these categories are not mutually exclusive, language from a plan in Edison International’s 2005 proxy filing describes a performance metric as “focusing on ethics and compliance programs, talent development and improved safety performance”, which is classified as both HS and TC. Another example from a plan in Spectra Energy Corporation’s 2008 filing is “leadership and employee development, diversity and a high-performance culture”, which is classified as both DEI and TC.

DEI, or TC) metric. At the firm-year level, a firm is classified as having an HC (HS, DEI, or TC) plan if, during that year, the firm adopts at least one CEO performance plan that includes an HC (HS, DEI, or TC) metric. An analogous process applies at the firm-year level to identifying firms with quantitative HC (HS, DEI, or TC) plans.

### *2.3. HC plan pay values and total CEO short-term incentive pay*

For each firm year, we estimate performance plan pay values both by HC type and across all short-term performance plans. Specifically, we compute plan values separately for each HC category (HS, DEI, or TC) and in total for all HC plans. For each category, as well as the total, we sum pay values for all of a firm's performance plans in that category in a given year, regardless of whether the pay is cash- or equity-based. For cash-based plans, we use the plan-level variable, "nonequitytarget", from the plan-based award table in Incentive Lab. For missing short-term plan values for firm-years prior to and including 2006, we use the value of the bonus variable from the total summary compensation table. For equity-based plan values, we use the variable "grantdatefv" from the same table. If "grantdatefv" is missing or zero, we impute its value by multiplying the target number of shares granted by the grant-date stock price.

For each firm-year, pay values across all short-term plans (HC and non-HC) are computed by summing the plan values from cash plans (marked by ISS with an award type of "cashShort") and equity plans with a horizon of 15 months or less.<sup>4</sup> For short-term cash plans, we add plan-level "nonequitytarget" amounts across all cash plans. For equity plans, we use "grantdatefv" when available, and when it is missing, we impute its value by multiplying the target number of shares

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<sup>4</sup> We set 15 months as our cutoff because there are 153 plans with horizons of 13 to 15 months, which we include in our short-term classification, in addition to 29,685 equity plans with horizons of 12 months or less. Our results remain qualitatively unchanged when we exclude these 153 plans.

granted multiplied by the grant-date stock price. The total value of short-term CEO incentive pay is then calculated as the sum of short-term cash and equity plan values for each firm-year.

Finally, we scale all pay value variables by salary to mitigate the influence of firm size on pay (Gabaix and Landier, 2008) and to capture the relative importance of plan values to the CEO. We scale plan values by salary rather than total pay because salary is independent of plan values, whereas total pay mechanically includes them.

#### *2.4. Explanatory variables*

Explanatory variables are grouped into four sets: firm characteristics, firm financial performance, human capital variables, and investor variables. All variable definitions are summarized in Appendix B. Following the compensation literature (Aggarwal and Samwick, 1999; Gaver and Gaver, 1993; Core, Holthausen, and Larcker, 1999), firm characteristics include workforce size, firm age measured as the number of years since the firm first appears in the Compustat database, capital expenditures scaled by total assets, R&D expenses scaled by total assets, and stock price volatility.<sup>5</sup> Firm financial performance is measured by return on assets (ROA) and cumulative stock return over the fiscal year.

Human capital variables capture the overall importance of human capital to the firm. Following Becker (1964), we define firm-level human capital as the collective knowledge, skills, abilities, and other attributes embodied in the workforce that can be deployed to create economic value. We measure it in two ways. First, revenue per employee serves as an output-based proxy for the importance of a firm's human capital. Second, we use intangible capital value per employee, obtained from WRDS (Peters and Taylor, 2017), which captures the overall stock of knowledge-

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<sup>5</sup> Given our focus on human capital, we measure firm size using the log of the number of employees. However, our results are robust to using the log of total assets as a size measure.

based assets such as R&D, software, and organizational capital that are closely tied to the productivity of a firm's workforce. Our results remain qualitatively unchanged when we replace total intangible capital with its knowledge capital subcomponent.

Investor variables capture investor influence and related institutional pressure on executive pay. We include two indicator variables to capture recent shifts in investor preferences: one for post-2017 observations (after the HCMC petition) and one for post-2020 observations (after the 2020 SEC rule change). We also include institutional ownership (percentage), and the percentage of "for" votes in the most recent Say-on-Pay (SOP) vote. Higher SOP support suggests that shareholders are more satisfied with the firm's executive compensation design. Because SOP voting began in 2011, the analysis using this variable can only be conducted from 2011 onward.

## *2.5. Summary statistics at the plan and firm-year level*

Table 1, Panel A presents plan-level summary statistics. About 12.3% of the 5,600 CEO performance plans in our sample include at least one HC metric, whereas only 3.9% are linked to other ESG metrics. Of the 5,600 HC plans, 95.2% are short-term, and HS, DEI, and TC metrics account for 37.6%, 14.3%, and 68.2% of all HC plans, respectively. Among the 5,212 plans with non-missing and non-zero pay values, the average (median) plan value is 1.6 (1.3) times the CEO's base salary. DEI plans have the highest plan values (2 times base salary), followed by TC plans (1.7 times) and HS plans (1.4 times). About 36% of HC plans include quantitative metrics. HS plans are most likely to have quantitative metrics (62.4%), DEI plans fall in the middle (43.1%), and TC plans are the least likely to use such metrics (17.6%).

Table 1, Panel B presents HC plan summary statistics at the firm-year level. When aggregated to the firm-year level, 20.3% of CEO pay packages include HC metrics: 7.9% include HS metrics, 3.2% have DEI metrics, and 13.9% have TS metrics. Across all firm years, 7.5% of

CEO pay packages include quantitative HC metrics. The average (median) total value of all CEO short-term plans is 2.06 (1.25) times the CEO's base salary. Comparing these numbers to the HC plan values reported in Panel A suggests that for firms offering HC plans, the value of HC plans represents the majority, and in some cases nearly all, of CEO short-term incentive pay.

The lower portion of Panel B presents summary statistics for firm characteristics. The average (median) number of employees for our sample firms is 23,513 (9,200). Sample firms have an average (median) age of 27.7 (25) years with a mean (median) CapEx-to-assets of 0.046 (0.031). R&D-to-assets has a mean (median) of 0.030 (0.000). About 44% of sample firms report R&D expenditures, and for non-reporting firms, we set missing R&D values to zero, consistent with common practice in the literature.<sup>6</sup> In line with overall market trends, average (median) annual stock return is 15.3% (15.8%). ROA has a mean (median) of 0.133 (0.123). Revenue per employee averages \$415,000, with a median of \$238,000, and intangible capital per employee averages \$382,000, with a median of \$202,000. Consistent with Incentive Lab's focus on large public firms, total institutional ownership is high, with an average of 73.5% and a median of 80.7%. Average SOP vote support is 72.7%, with a median of 75.4%.

### **3. Empirical Analysis**

As stated earlier, our study has four main areas of analysis: (i) to provide a comprehensive description of HC plans and their evolution over time, (ii) to analyze the characteristics of firms that adopt HC plans and how HC plan adoption is associated with investor perspectives and preferences, (iii) to examine the importance of HC plan values for CEO pay, and (iv) to examine

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<sup>6</sup> Our findings on R&D-to-assets and other determinant variables remain qualitatively unchanged if we include a non-missing R&D indicator as a control variable in all regressions.

the relationship between the adoption of HC plans and subsequent financial performance. Below, we address each of these areas in turn.

### *3.1. Description of HC plans and their evolution over time*

Figure 1.a presents the time trend of the percentage of sample firms adopting HC plans. This percentage increases gradually from 4% in 1998 to 17% in 2017, with many years seeing increases of 1% or less. In 2018, there is a significant jump from 17% to 41%. In 2021, there is a second jump from 46% to 52%. These jumps in timing immediately follow the 2017 HCM Coalition petition and the 2020 SEC rule change, which suggests that shifts in investor preferences may have contributed to HC plan adoption. Figure 1.b presents the time trend by HC plan type (HS, DEI, and TC). This figure shows that the 2018 jump is driven by a surge in TC plans, while the 2021 jump is largely attributable to a rise in DEI plans. In contrast, growth in HS plans has been more gradual.

Figure 2.a presents the percentage of firms adopting HC plans for at least one year during the sample period by industry. Industry classification is based on the Fama–French 12 industry sectors. In seven of the 12 industry sectors, over 50% of firms have adopted an HC plan at least once. The sectors with the highest adoption rates are oil, gas, and coal extraction (76%) and utilities (also 76%). Sectors with the lowest adoption rates are wholesale, retail, and some services (36%) and telephone and television transmission (40%). The former sector is typically considered to be labor-intensive and the latter capital-intensive, suggesting that traditional notions of labor or capital intensity may not be directly associated with HC plan adoption. Figure 2.b presents the adoption of HC plans by industry sector for 1998-2017 and 2018-2023. The industries with the largest increase in HC plans between time periods are consumer nondurables, business equipment,



telephone and television transmission, and finance. Again, these industry sectors represent a mix of sectors that are traditionally considered both labor- and capital-intensive.

Figures 3.a through 3.c present the adoption of the three HC metric types by industry sector for the 1998-2017 and 2018-2023 time periods. Of the 12 industry sectors, 10 show an increase in HS plan adoption between the 1998-2017 and 2018-2023 time periods, with 4 showing an increase of 10% or more (Figure 3.a). The largest increases are in oil, gas, and coal extraction (63% to 85%) and utilities (58% to 80%). All 12 industry sectors show an increase in DEI and TC plan adoption in 2018-2023 versus 1998-2017 (Figures 3.b and 3.c). Out of 12 industries, 11 more than tripled their adoption rate of DEI plans, while 7 more than tripled their adoption of TC plans.<sup>7</sup>

Figure 4 illustrates how HC metric types are used in CEO performance plans. Across all firm-years, 52.0% do not include any type of HC plan. The remaining 48% include at least one type of HC plan. More specifically, 38.4% of firm-years include HC plans with one type of metric (HS 5.9%, DEI 2.2%, TC 30.3%). Eight percent of firm-years include HC plans that utilize two types of HC metrics (HS + DEI 1.3%, HS + TC 3.8%, DEI + TC 3.0%). Finally, 1.5% of firm-years include HC plans that utilize all three types of metrics. The prevalence of single metric type plans suggests that firms pursue relatively focused human capital objectives.

Figure 5 presents the time trend of the percentage of HC plans that use quantitative targets for HC metrics. The adoption rate increases over time reaching 76% for HS plans, 55% for DEI plans, and 21% for TC plans by 2023. Figure 6 presents the time trend of HC plan value as a

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<sup>7</sup> Because the Fama–French 12 Industry classification does not have a dedicated technology sector, we follow Kile and Phillips (2009) and identify technology firms using SIC codes. The HC plan adoption pattern we observe for the full sample holds within the technology sector as well. The overall adoption rate is about 45% and all three subcategories show significant increases in 2018-2023 relative to 1998-2017. Specifically, between these two periods, overall adoption of HC plans rises from 21.9% to 62.4%, adoption of HS metrics increases from 1.1% to 3.8%, DEI metrics from 1.7% to 18.3%, and TC metrics from 20.7% to 55%.

multiple of CEO base salary by HC metric subcategory, based on firm-years with HC plans. As the figure shows, HC plan values grow substantially over time across all three HC metric types.

### *3.2. Determinants of the adoption of HC plans*

#### *3.2.1. Conceptual development of HC plan determinants*

We are primarily interested in two sets of determinants for the adoption of HC plans. First, we expect that firms in which human capital is more important are more likely to adopt HC plans both to attract CEOs with higher HC management abilities and to reinforce that match through targeted incentives. As discussed earlier, this hypothesis draws on both matching theory and incentive contracting theory. Gabaix and Landier (2008) posit that CEOs are matched with firms in a competitive labor market based on their talent and that compensation design reflects the matching. Supporting CEO-firm matching, Pan (2017) shows that firms with specific characteristics achieve greater productivity and offer higher CEO pay when paired with CEOs whose skills best fit those needs. Holmstrom (1979) further suggests that tying CEO pay to a broader range of observable outcomes (beyond financial metrics) can better align the CEO's effort with the firm's diverse objectives, reducing incentive distortions. Moreover, if human capital is a key long-term value driver for firms, as argued by Becker (1964), incorporating HC metrics into CEO incentive contracts focuses executive attention on managing this critical resource.

Second, we expect investor preferences to influence the structure of compensation plans. If investors exhibit an increased preference for HC plans (or a particular type of HC plan), firms are more likely to adopt such plans. The literature has long recognized the importance of institutional investors in shaping compensation design (e.g., Hartzell and Starks, 2003). More recent evidence confirms that institutional investor care about pay disclosures (e.g., Pan et al., 2022) and that their demand can drive firms' nonfinancial disclosure and policy changes (e.g.,

Cohen, et al. 2023a). As discussed earlier, in 2017 a potential sea-change took place in investor preferences and in 2020 the SEC adopted new HC disclosure requirements. Thus, we expect the adoption of HC plans to increase post-2017 and post-2020. Further, we expect that firms with higher institutional ownership are more likely to be influenced by investor preferences when designing compensation and that firms with low shareholder approval of compensation are more likely to adopt new compensation plan designs, such as HC plans.

### 3.2.2. Empirical model and correlations

We employ the following multivariate linear probability model to explore the determinants of HC plan adoptions:

$$\begin{aligned}
 HC\ Plan\ (0/1)_{it} = & \\
 & \alpha + \sum_{k=1}^a \beta_k Firm\ Characteristics_{k,it-1} + \sum_{k=a+1}^b \beta_k Firm\ Financial\ Performance_{k,it-1} \\
 & + \sum_{k=b+1}^c \beta_k Human\ Capital\ Vars_{k,it-1} + \sum_{k=c+1}^d \beta_k Investor\ Vars_{k,it-1} + \gamma_j + \mu_t + \varepsilon_{it} \quad (1)
 \end{aligned}$$

For firm  $i$  in year  $t$ , the dependent variable,  $HC\ Plan\ (0/1)_{it}$ , is an indicator variable that equals one if the CEO receives a new compensation plan that includes an HC metric, and zero otherwise. To attenuate reverse causality concerns, explanatory variables are measured in the prior year.  $\gamma_j$  indicates industry fixed effects, and  $\mu_t$  indicates year fixed effects. To control for potential serial correlation and heteroskedasticity, standard errors are clustered at the firm level.

Explanatory variables are as described earlier and detailed in Appendix B. Test variables that proxy for human capital importance are revenue-per-employee or intangible capital-per-employee. We expect both measures to be positively associated with human capital importance and, in turn, with the likelihood of adopting an HC plan. Test variables that proxy for investor influence include a post-2017 indicator variable (after the HCM Coalition petition), a post-2020 indicator variable (after the 2020 SEC rule change), institutional ownership, and percentage of

“for” votes in the most recent SOP. We expect the indicator variables and institutional ownership to be positively associated with HC plan adoption, and SOP VotedForPct to be negatively associated with HC plan adoption.

Table 1, Panel C reports univariate comparisons of explanatory variables before 2018 and from 2018 onward. This comparison provides insight into how these variables have evolved over time and helps us understand the sharp increase in HC plan adoption in 2018. Statistical significance of mean (median) differences is based on *t*-tests (Wilcoxon rank-sum tests). Firms in the later period are larger and older. However, investment intensity, measured by CapEx-to-assets or R&D-to-assets, is lower, as are annual stock returns and ROA. Both proxies for human capital importance increase significantly on average, although only the median difference in intangible capital-per-employee is statistically significant. Institutional ownership also rises significantly, while SOP support for executive pay remains comparable. Overall, these patterns align with our expectations that greater human capital dependence and evolving investor preferences contribute to the increased adoption of HC plans.

Table 2 presents correlations between variables used in our analysis. All explanatory variables are significantly correlated with the dependent variable (HC Plan). Specifically, workforce size, firm age, CapEx-to-assets, revenue per employee, intangible capital per employee, and institutional ownership are positively correlated with the presence of HC plans. R&D-to-assets, stock volatility, annual stock return, and ROA are all negatively correlated with the HC plan indicator. Pairwise correlations among the explanatory variables are all below 0.4, with most between -0.1 and 0.1, suggesting that multicollinearity is unlikely to be a concern in our analysis.

### *3.2.2. Results from determinants models of HC plan adoptions*

Table 3 presents the results of estimating the linear probability model in Equation (1). In Table 3, Panel A, we assess the incremental contribution of each group of variables by estimating the model in stages. We begin with a specification that includes only basic firm characteristics (model 1). We then add firm financial performance variables (model 2), human capital variables (model 3), and investor variables (models 4 and 5). Finally, we estimate the model that include all variable groups (models 6 and 7). These models include either no fixed effects or year fixed effects, as indicated at the bottom of the table. We assess the contribution of industry fixed effects separately in Panel B.

Table 3, Panel A shows that the coefficients for firm age and CapEx-to-assets are significantly positive, suggesting that older firms and firms with higher capital spending are more likely to adopt HC plans. Larger firms and firms with higher R&D-to-assets, however, are less likely to adopt HC plans. Model 1 shows that firm characteristics alone explain 17.3% of the variation in HC plan adoption. Model 2 shows that the coefficients on both firms' financial performance variables are negative; the coefficient for ROA is statistically significant. This result is consistent with our expectation that better-performing firms are less likely to adopt HC plans. Notably, adding the two performance variables increases the model's exploratory power only marginally —  $R^2$  increases from 17.3% to 17.7%.

In contrast, adding one HC variable, the log value of revenue-per-employee, in model 3 increases  $R^2$  to 19.0% — an 8.7% increase. The coefficient for  $\ln(\text{Revenue}/\text{Employees})$  is significantly positive which is consistent with our first hypothesis. In model 4, we add investor variables and drop year fixed effects (because two of the investor variables are time indicator variables). Institutional ownership is not significant, but both time indicators load positively and

significantly, confirming that the sharp increase in HC plan adoption documented earlier also holds in a multivariate setting. In model 5, we add SOP VotedForPct for the subsample for which this variable is available, i.e., from 2011 onward. Its coefficient is significantly negative, suggesting that firms are more likely to adopt HC plans when shareholders are less satisfied with executive compensation. The full specification is presented in models 6 and 7, for the full sample and the subsample with SOP data available, respectively. Overall, the determinants that are significant in other models largely remain significant, especially those related to human capital and investors.

Table 3, Panel B presents results for the full specification when industry fixed effects are included. Columns 1 and 2 correspond to model 6 from Panel A estimated with Fama–French 12 and 49 industry fixed effects, respectively, while columns 3 and 4 report model 7 from Panel A under the same specifications. Notably, adding industry fixed effects increases the models'  $R^2$  by 27% to 44%, depending on the specification. The coefficient for  $\ln(\text{Employees})$  switches sign, becoming positive and significant, and the coefficient for institutional ownership becomes significantly positive in models 1 and 2. This suggests that firms with larger workforces and higher institutional ownership than their industry peers are more likely to adopt HC plans. In addition, coefficients for CapEx-to-assets, R&D-to-assets, and firm age become insignificant. This implies that the significant coefficients for these variables in Panel A reflect industry, rather than firm-specific, characteristics. The sign and significance of other determinants, primarily firm financial performance and human capital importance variables, are similar to those reported in Panel A.

In the last four columns of Panel B, when we replace the two post-2017 and post-2020 indicators with full year fixed effects, the results remain consistent across both the full sample and the SOP subsample. One notable difference is that stock price volatility becomes significant in the full sample once year fixed effects are included, while it remains insignificant for the SOP

subsample. This pattern suggests that time-varying aggregate factors in the earlier period of the sample may have obscured the underlying cross-sectional relation when only limited time controls are included. With full year fixed effects absorbing these common shocks, the firm-level association between stock volatility and HC plan adoption becomes apparent. Supporting the importance of human capital in explaining adoption decisions, revenue-per-employee is again positive and significant across all four models.

In Table 3, Panel C, all models in Panels A and B that previously included revenue-per-employee as a proxy for human capital importance are re-estimated using intangible capital-per-employee instead. As shown in the table, the coefficient of the alternative HC importance variable is positive and significant across all models, confirming the importance of human capital as a significant determinant of HC plan adoption.

Table 4 presents results with industry fixed effects based on the Fama–French 12 classification for the full specification (models 1 and 3 in Table 3, Panel B), estimated separately for each type of HC plan: HS plans (models 1 and 4), DEI plans (models 2 and 5), and TC plans (models 3 and 6).<sup>8</sup> Models are estimated using a sample of observations for firms that have adopted a specific type of HC plan in a given year (e.g., an HS plan) pooled with firms that have not adopted any type of HC plan in that year. In other words, the control group (i.e., firm-year observations without HC plans) is identical across models, while the treated group differs according to the HC plan type under study.

As Table 4 shows,  $\ln(\text{Revenue}/\text{Employees})$  is consistently positive and significant across all models, supporting the idea that human capital importance increases the likelihood of HC plan

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<sup>8</sup> Results are qualitatively similar when industry fixed effects are based on Fama–French 49 industry classifications.

adoption across metric types.  $\text{Ln}(\text{Employees})$  is positive and significant in all but the last column where the sample is limited to 2011 onward due to the inclusion of the SOP variable. This result further confirms that a larger human capital stock increases the likelihood of HC plan adoption. Stock volatility is positively associated with the likelihood of HS plan adoption, suggesting a potential link between equity market risk and labor safety and health concerns. Annual stock return is insignificant throughout except for TC plans from 2011 onward (last column). ROA is negatively associated with both HS and DEI plan adoptions. The results for the firm financial performance variables support that firms are less likely to adopt HC plans when financial performance is strong.

It is worth noting that institutional ownership is significantly positively related to the adoption of HS and TC plans, but not to the adoption of DEI plans. The coefficients for the two time indicator variables are positive and significant, with the post-2017 indicator having the largest coefficient for TC plans and the post-2020 indicator for DEI plans. These patterns align with the time trends observed in Figure 3. As shown in models 4 through 6, the percent of “for” SOP vote is negatively related to plan adoption across all three types. This is consistent with the idea that when shareholders are more satisfied with existing executive compensation, firms are less likely to make changes to compensation design, including adopting HC plans.

### *3.2.3. Determinants of HC plan value*

In this section, we examine the determinants of HC plan values for the subset of firms that adopted HC plans. For each firm-year, the dependent variable is the natural log of total plan value, which is summed across all HC plans (model 1), all HS plans (model 2), all DEI plans (model 3), or all TC plans (model 4) and is scaled by CEO salary. The analysis is restricted to firm-years with HC plans that report non-missing and non-zero plan values. The explanatory variables are the same



as those used in Table 4 except for the SOP variable, which is excluded here to ensure sufficient sample size.

Table 5 presents the results. For all HC plans, model 1 shows that firms that are larger, riskier (i.e., have higher stock volatility), invest less in capital expenditures or R&D, and have higher revenue-per-employee grant HC plans with higher pay multiples relative to CEO salary. Also, the coefficients for both time indicators are significantly positive, suggesting that HC plan values rise by roughly 17% after 2017 and by another 3.7% after 2020.

Models 2 to 4 analyze plan values separately for each HC subcategory. Because each specification includes only firm-year observations with non-missing and non-zero plan values for that specific plan type (HS, DEI, or TC), sample sizes vary from 664 observations for DEI plans to 2,849 observations for TC plans. Coefficients for  $\ln(\text{Employees})$  and  $\ln(\text{Revenue}/\text{Employees})$  are significantly positive in all three models, which confirms that human capital importance is a key determinant of HC plan value for all metric types. The loadings on other variables differ by HC metric type but are generally consistent with the pattern observed when plan-type indicators were the dependent variables in Table 4. HS plan value as a multiple of CEO salary is significantly positively related to stock volatility, consistent with the view that health and safety performance is linked to equity market risk. DEI plan value is positively related to capital expenditures and to annual stock return but negatively related to ROA. TC plan value is negatively related to both capital expenditures and R&D, suggesting that firms with lower traditional investments place greater emphasis on talent and culture. The coefficient for the post-2017 indicator is significantly positive across models, while the post-2020 indicator is only significant for HS plans. This indicates that HC plans adopted after 2017 are associated with higher plan values, whereas post-2020 adoptions generally are not. Coefficient estimates suggest that post-2017, DEI plans had the

largest increase in plan value as a multiple of CEO salary (30.1%), followed by TC plans (16.8%) and HS plans (14.8%).

### *3.3. Importance of HC plan values for CEO pay*

#### *3.3.1. CEO short-term pay and HC plans*

We next investigate whether CEOs with HC plans earn higher compensation than those without such plans. Because more than 95% of HC plans have horizons of one-year or less, we focus on total short-term incentive pay and compare this amount across CEOs with and without HC plans. We run a cross-sectional model in which the dependent variable for each firm-year is the natural log of one plus the ratio of the CEO's total short-term incentive pay in that year to base salary. To examine whether short-term incentive pay differs between CEOs with HC plans and those with only non-HC plans, we include indicator variables equal to one if the CEO has a given type of HC plan and zero otherwise. All models include the same set of explanatory variables as in earlier tables (coefficients suppressed for brevity), along with industry and year fixed effects.<sup>9</sup> In addition, we include another set of control variables to mitigate the concern that CEO short-term incentives are also related to other types of performance metrics embedded in their performance plans. Specifically, we add four indicator variables capturing whether the plans granted in that year include stock-price-based, earnings-based, cash-flow-based, and/or sales-based financial metrics. We also include an indicator for whether the CEO's performance plans contain other non-HC ESG-related metrics.

Table 6, Panel A presents OLS regression results for the entire sample. There are five models which include different indicator variables as follows: HC plan (model 1), HS plan

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<sup>9</sup> Time indicators are absorbed by year fixed effects and the SOP variable is excluded here to preserve sample size.

(model 2), DEI plan (model 3), TC plan (model 4), and indicator variables for all three plan types (model 5). Except for the DEI plan indicator, none of the indicator variables are significant. The coefficient for the DEI plan indicator is 0.083 and significant in model 3, where it is included alone, and in model 5, where it is included with the two other plan type indicators. The economic significance is potentially large: CEOs with at least one DEI plan receive over 8% more in short term pay relative to salary than CEOs without such plans.

Table 6, Panel B presents results for an entropy balanced model to address the possibility that firms adopting HC plans differ fundamentally from firms that do not. Entropy balancing ensures close to exact co-variant balance between treated and control observations without reducing sample size (Hartzmark, 2015; Heimer and Simsek, 2019). To apply entropy balancing, we match observations with HC plans to observations with only non-HC plans based on industry, year, our four firm characteristic variables, and our two firm financial performance variables.<sup>10</sup> We then use the weights generated from the entropy balancing procedure to re-weight the control observations so that their characteristics closely match those of the treated group, thereby mitigating selection-bias concerns. Because entropy balancing requires a single treated group, we cannot implement this analysis for model 5 of Panel A, which includes indicators for all three HC plan types, since this specification effectively creates three treated groups. Results in Panel B are consistent with those in Panel A — only the DEI indicator has a significant and positive coefficient,

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<sup>10</sup> Specifically, we use the “ebalance” command in Stata to reweight the control group such that the means of observable covariates (employment, firm age, CapEx to assets, R&D to assets, return volatility, stock return, ROA, and percentage of institutional investors) match those of the treated group. This is done separately for each treatment condition: (1) HC plan, (2) HS plan, (3) DEI plan, and (4) TC plan. Each treatment therefore yields its own weight vector, and we run weighted regressions using the [pw=weight] option with robust standard errors clustered at the firm level.

which implies a significant economic pay differential of 11.4% for CEOs with HC plans relative to CEOs without them.

Table 6, Panel C presents results for first-time HC plan adoptions, excluding observations that represent subsequent adoptions. Our approach follows first-adoption models in the literature (e.g., Bizjak, Lemmon, and Whitby, 2009) and aligns with the spirit of an event-study design, which helps mitigate potential serial correlation in HC adoptions over time. Results in Panel C are consistent with those in Panels A and B. In columns 1 to 4, only the coefficient on first DEI adoption is positive and significant. In column 5, when all three HC plan type first-adoption indicators are included, the DEI first-adoption indicator remains positive and significant.

### *3.3.2. CEO short-term pay and HC plan design features*

To explore the association between CEO short-term incentive pay and HC plans more deeply, we utilize information about metric and plan characteristics. Specifically, metrics or plans with features that are difficult to monitor or evaluate leave room for opportunistic behavior by managers. It seems reasonable to assume that qualitative metrics would be more difficult than quantitative metrics to monitor and evaluate. Further, it seems reasonable to assume that more complex plans, e.g., plans with multiple metrics and metric types would be more difficult to monitor and evaluate than plans with a single metric. If this is the case, such features would be associated with higher pay, all else constant.

Table 7 presents models that include metric details meant to capture the difficulty of monitoring and evaluating the CEO under a performance plan. Table 7, Panel A reruns models from Table 6, Panel A with indicator variables that distinguish between quantitative and qualitative HC measures. Thus, models include six, rather than three, indicator variables (HS quantitative, HS qualitative, DEI quantitative, DEI qualitative, TC quantitative, TC qualitative). Only DEI plans

with a qualitative performance metric have a significant positive coefficient, implying a short-term pay premium of 13% as a multiple of salary for CEOs with such plans (models 3 and 5).

Table 7, Panel B reruns models from Table 6 with indicator variables that capture the number of different types of HC metrics used in a performance plan. Model 1 shows that CEOs with HC plans using multiple HC metrics, regardless of types, receive significantly higher short-term pay than other CEOs (the coefficient implies a 5.4% short-term incentive premium). Model 2 shows that CEOs with HC plans using multiple types of HC metrics receive significantly higher short-term incentive (the coefficient implies a 5.5% short-term incentive premium). Finally, models 3-6 show that a higher number of DEI metrics is significantly associated with higher short-term incentive relative to salary. The coefficients imply a short-term incentive premium of 3.4% (column 4) and 3.0% (column 6) for each additional DEI metric.

### *3.4. HC plan adoption and subsequent firm financial performance*

In this section, we examine firm financial performance following the adoption of HC plans. If HC plans motivate CEOs to improve human capital management in an economically valuable way, we should observe stronger financial performance after adoption. Alternatively, if HC plans are adopted merely to signal alignment with market trends and investor preferences, we would expect no meaningful association with financial performance. Moreover, given the difficulty of monitoring some HC metrics, HC plans may simply serve as a tool for CEOs to secure higher pay.

Table 8 presents regression results for annual stock returns and ROA in years zero, one, and two following HC plan adoption. All models include industry and year fixed effects, HC plan type indicators, same set of firm characteristics as in prior tables, plus institutional ownership, market-to-book ratio, stock momentum, and lagged performance measures to account for potential reversal or momentum in financial performance. As in Tables 6 and 7, we also include the five

indicator variables capturing other performance metrics used in CEO performance plans to mitigate the possibility that any observed differences in performance are driven by these additional metrics.

Table 8, Panels A and B present results for ROA and stock returns, respectively. The only significant indicator variable in Panel A is DEI plan indicator in model 7 and model 13, suggesting that firms adopting DEI plans have weaker operating performance in the year of adoption. The only significant coefficients in Panel B are for HS plans in year one and two, suggesting weaker stock performance in the two years following HS plan adoption. One potential concern with these results is that it may reflect the metric choice of generally poorly performing firms, since our determinants analysis shows that weaker firm performance is associated with greater HC metric adoption. However, this explanation cannot explain why a spurious relation would appear only for DEI metrics in Panel A and for HS metrics in Panel B, since this performance selection concern should apply to all HC metrics. Regardless, we conduct an entropy-balancing analysis, as specified earlier, in which prior firm financial performance is included as one of the covariates balanced between firms with and without HC metrics (and with and without a specific type of HC metric). Table 8, Panels C and D present results for the entropy balanced sample. Again, model 7 of Panel C shows that in the year of DEI plan adoption, firms experience relatively poor operating performance. All other coefficients on the HC plan indicators are insignificant. All plan coefficients are insignificant for stock performance in Panel D.

Overall, these findings provide no evidence that HC plan adoption is associated with subsequent improvements in financial performance. Combined with the higher CEO short-term pay associated with DEI plans documented earlier, the weak ROA performance of DEI-plan firms raise additional concerns about the possibility of managerial rent-seeking in these firms.

#### **4. Conclusion**

Our paper documents a substantial increase in the incorporation of HC metrics in CEO compensation over time. This trend occurs across all industries and unfolds in two waves: a post-2017 surge in DEI plans (after the HCM Coalition petition) and a post-2020 surge in TC plans (after the SEC rule change). Employee headcount and human capital importance are the most robust determinants of the likelihood of adopting an HC plan, including across subcategory types, as well as the magnitude of plan values relative to CEO salary. These results align with matching theory and incentive alignment theory, which posit that firms that depend heavily on human capital reward CEOs through HC-linked compensation. Firms with higher institutional ownership and lower support in their most recent SOP vote are also more likely to adopt HC plans, highlighting the role of investor preferences in shaping CEO compensation.

In general, CEO total short-term incentive pay does not differ between firms with HC plans and those without. However, CEO total short-term pay is significantly higher when compensation plans include qualitative DEI metrics or when multiple HC metrics or metric types are used. HC plan adoptions are not associated with better future stock or accounting performance. In fact, DEI plans are negatively associated with subsequent operating performance. These results raise concerns about agency problems, since higher short-term pay appears only in plans using measures that make it inherently harder to monitor and evaluate the CEO, and the firms using such plans do not exhibit better financial performance.

Our study has implications for researchers, investors, and policymakers. For researchers, we show that human capital metrics are distinct from other ESG metrics and merit independent consideration. The strong association between firms' reliance on human capital and their adoption of HC plans underscores the potential benefit of a focused approach — matching firm

characteristics with targeted performance metrics can yield a sharper and deeper understanding of CEO pay design. For investors, the rise of non-financial metrics poses opportunities and risks. While HC metrics might signal a firm's commitment to long-term value creation through investment in human capital, their relative opacity may exacerbate agency problems. Therefore, investors should scrutinize not just the presence of non-financial metrics but also the ability to monitor and evaluate the CEO using such metrics. Regarding policy, as regulators consider new reporting standards, they must balance transparency with the practical challenges of measuring and overseeing non-financial outcomes. Metric selection and oversight could be key to harnessing the potential benefits of HC disclosures and the use of HC metrics in CEO pay.



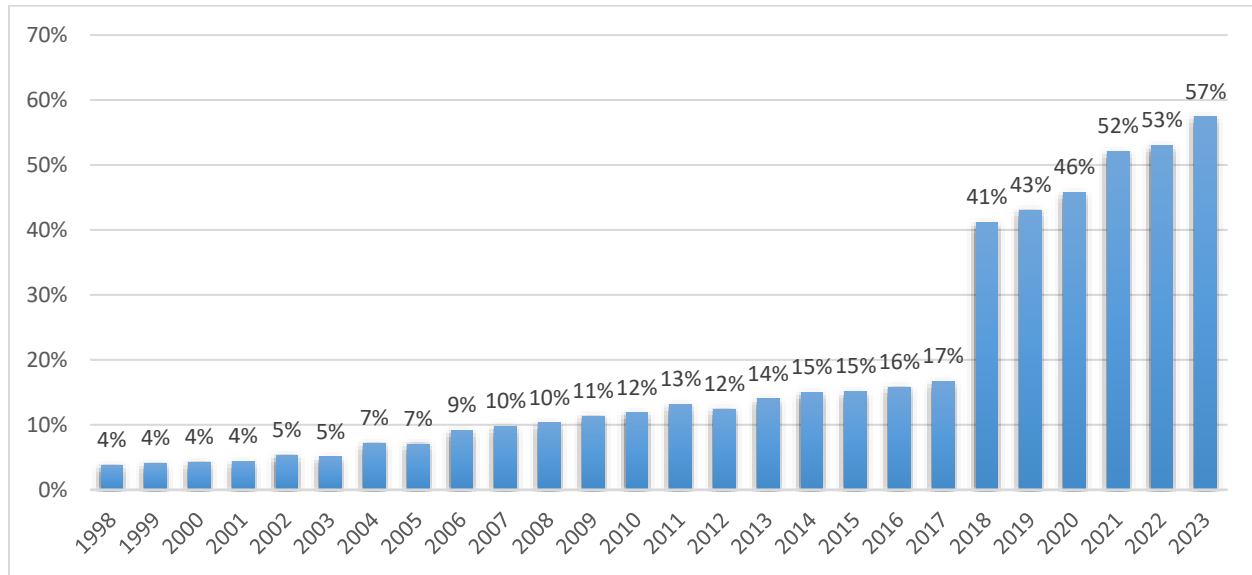
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**Figure 1.a Percentage of Firms with Human Capital Metrics in CEO Performance Plans, 1998-2023**



**Figure 1.b Percentage of Firms with Human Capital Metrics in CEO Performance Plans by Human Capital Metric Type, 1998-2023**

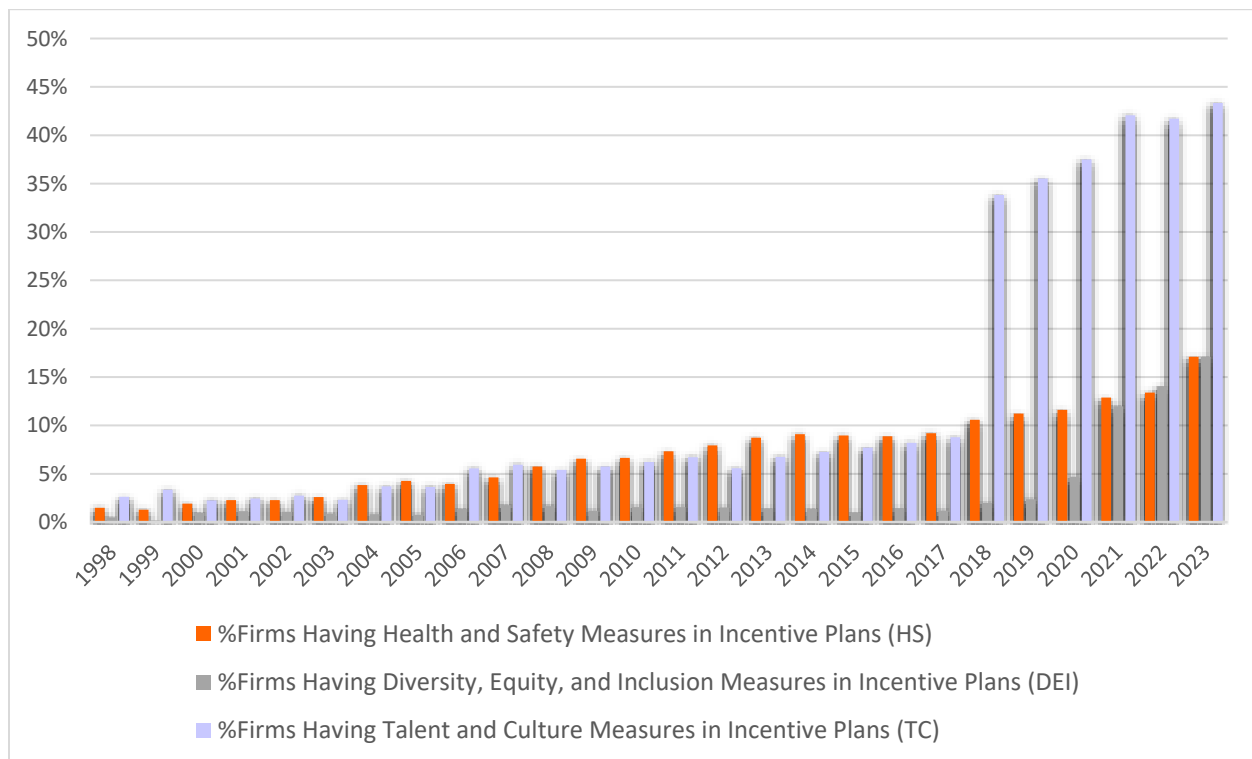
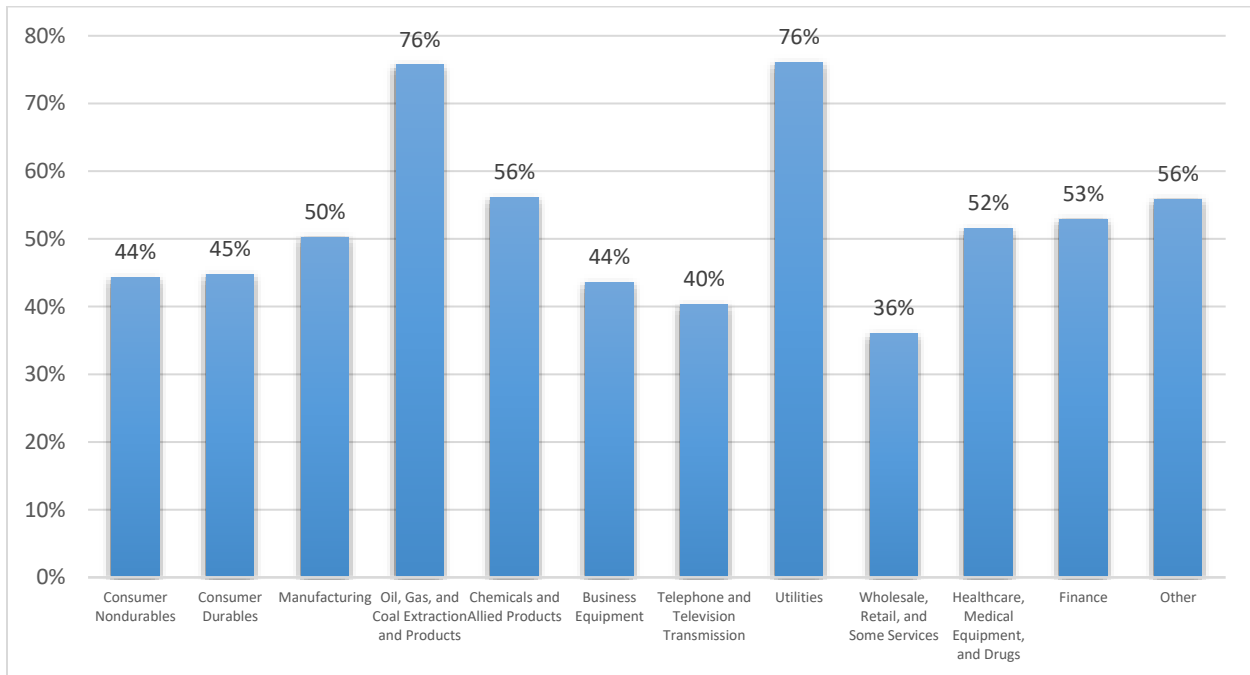


Figure 1.a presents the time-series trend in the percentage of firms adopting HC metrics in CEO performance plans from 1998 to 2023, and Figure 1.b breaks out this trend by HC metric type. Both figures are based on plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1.

**Figure 2.a Percentage of Firms with Human Capital Metrics in CEO Performance Plans by Industry, 1998-2023**



**Figure 2.b Percentage of Firms with Human Capital Metrics in CEO Performance Plans by Industry, Pre vs. Post 2017**

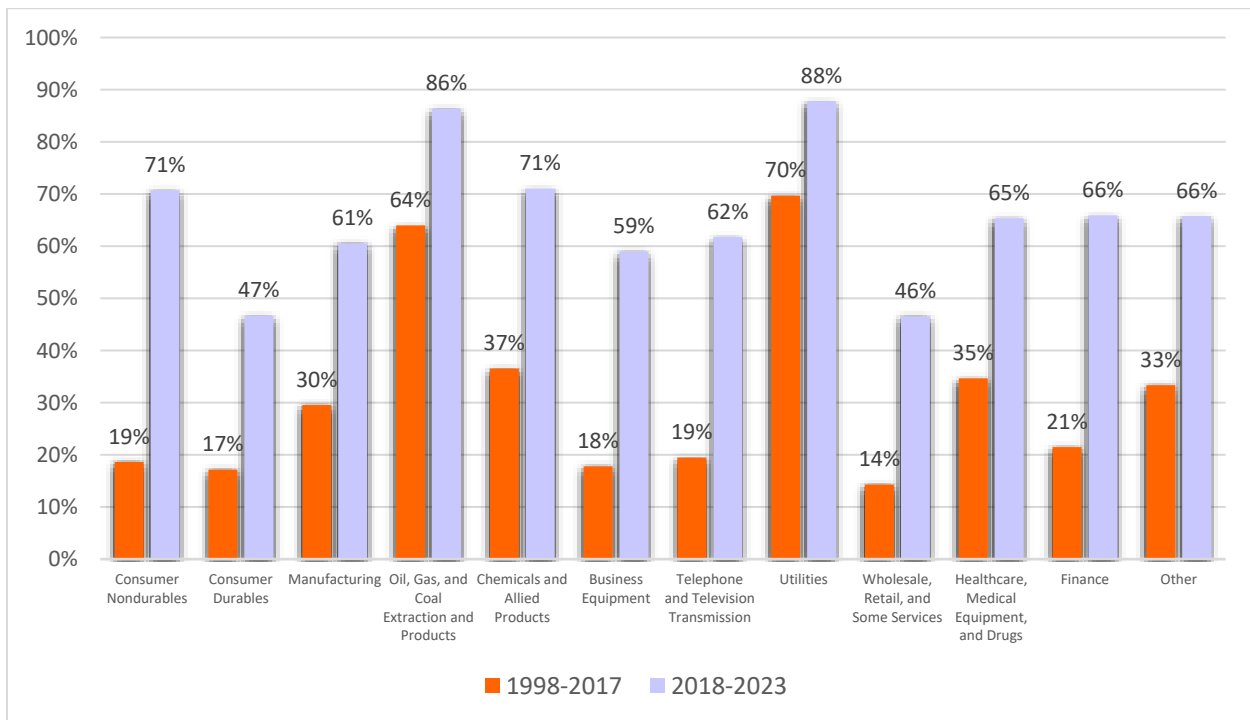
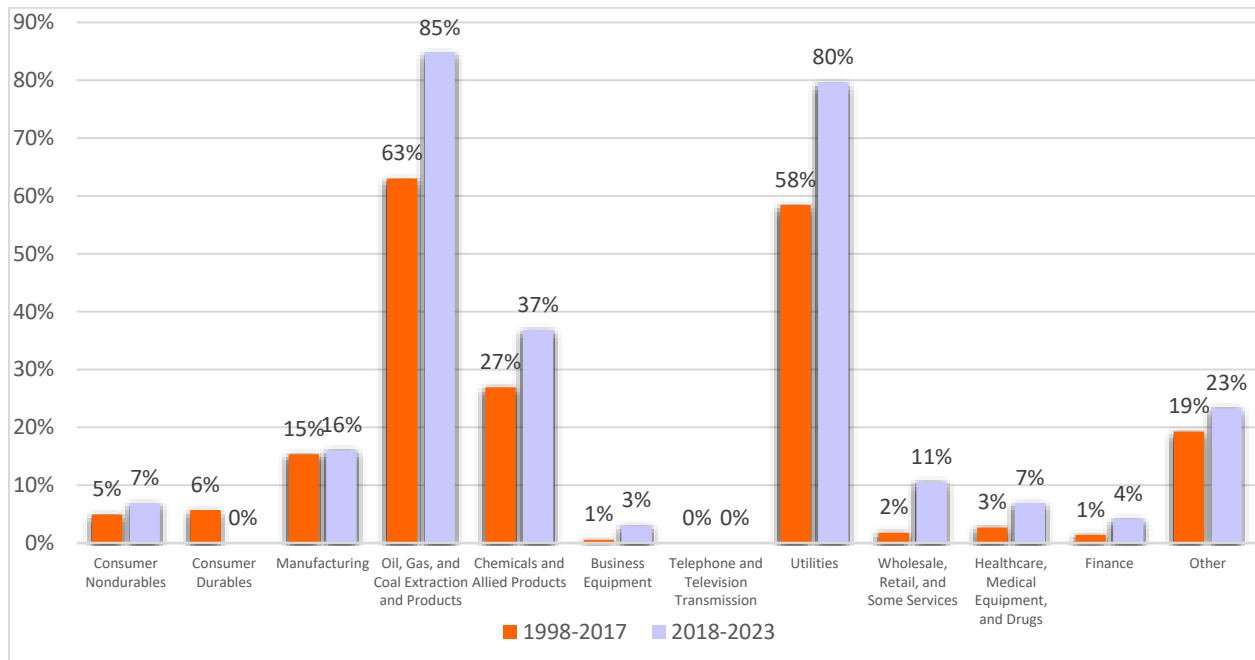
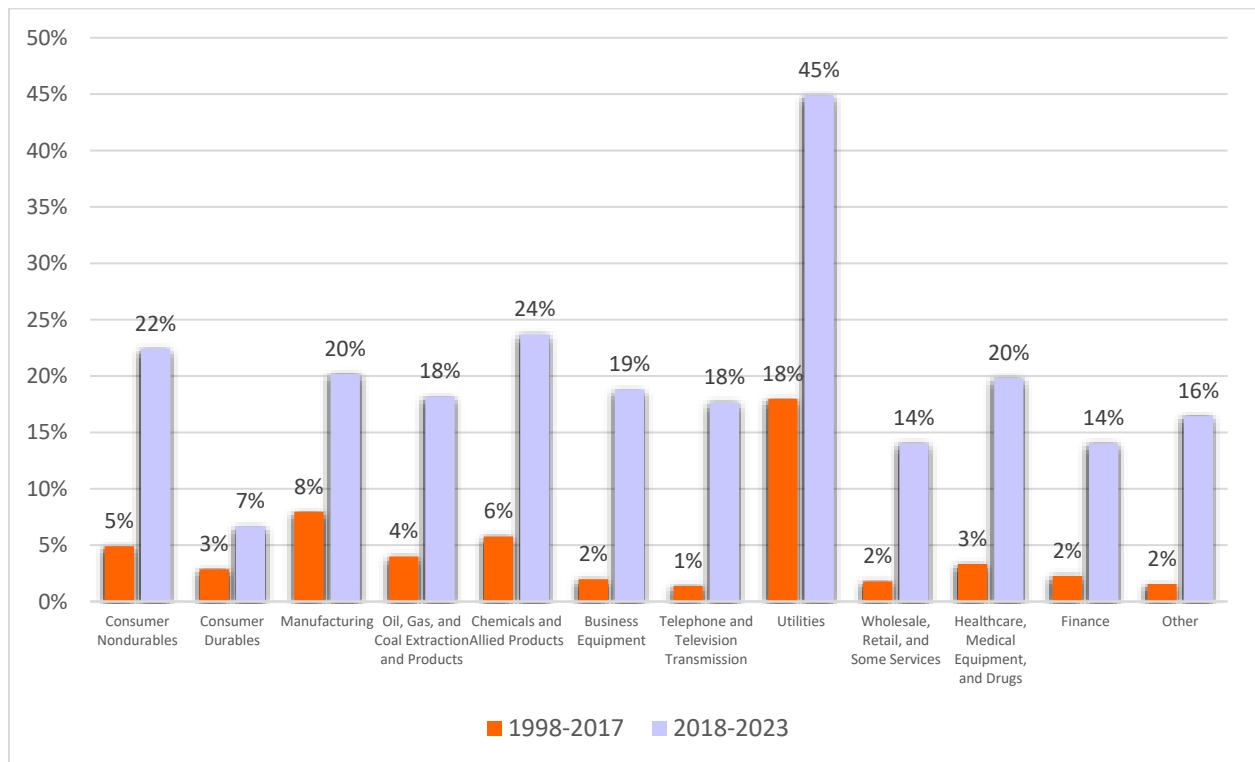


Figure 2.a presents the percentage of firms adopting HC metrics in CEO performance plans from 1998 to 2023 across the Fama–French 12 industries. Figure 2.b reports the distribution separately for two periods, 1998–2017 and 2018 onward. Both figures are based on plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1.

**Figure 3.a Percentage of Firms with Health and Safety Metrics in CEO Performance Plans, Pre vs. Post 2017**



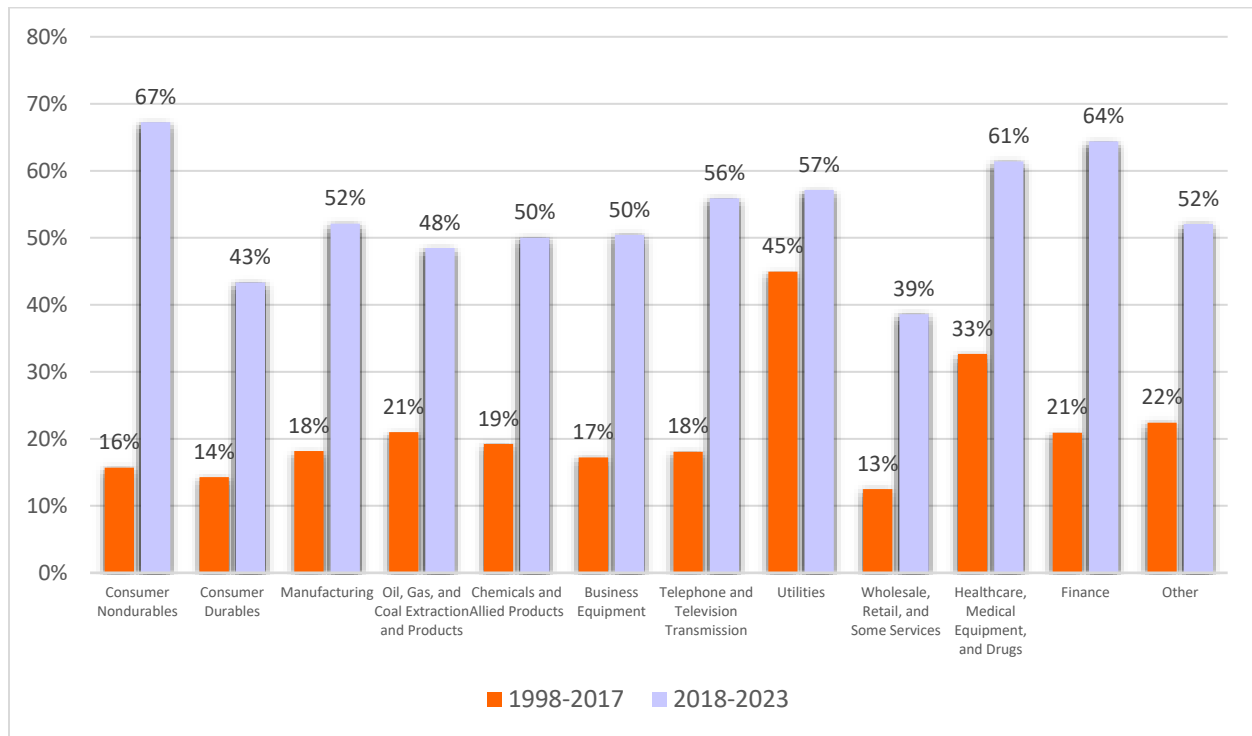
**Figure 3.b Firms with DEI Metrics in CEO Performance Plans, Pre vs. Post 2017**



(Figure 3 continued.)

**Figure 3 continued.**

**Figure 3.c Firms with Talent and Culture Metrics in CEO Performance Plans, Pre vs. Post 2017**



Figures 3.a–c present the percentage of firms adopting HS, DEI, or TC metrics in CEO performance plans from 1998 to 2023 across the Fama–French 12 industries, reported separately for 1998–2017 and 2018 onward. All figures are based on plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1.

**Figure 4. Combinations of Human Capital Metric Types in CEO Performance Plans, 2018-2023**

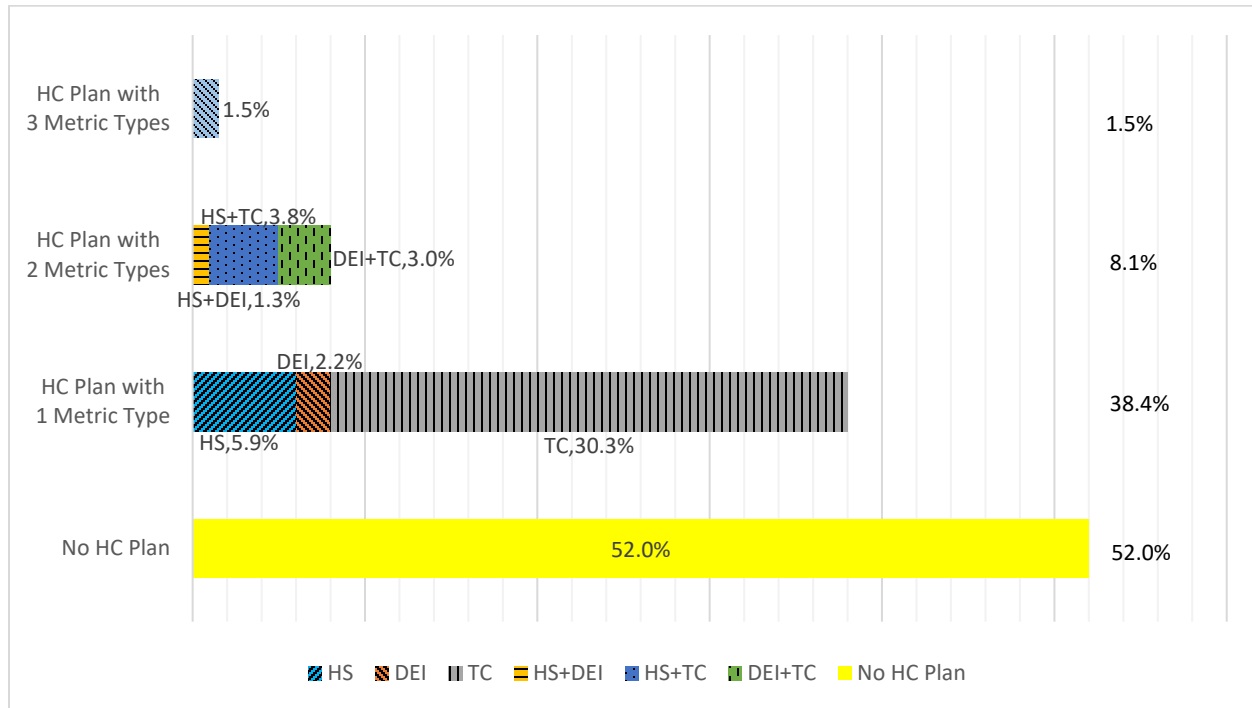


Figure 4 presents how firms combine the three types of HC metrics in CEO performance plans from 1998 to 2023. The bottom bar shows the percentage of firms without HC plans, and the top three bars show the percentages of firms using three metric types, two metric types, and one metric type, respectively. The sample includes all plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1.



**Figure 5. Percentage of CEO Human Capital Performance Plans Using Quantitative Metrics by Human Capital Metric Type, 1998-2023**

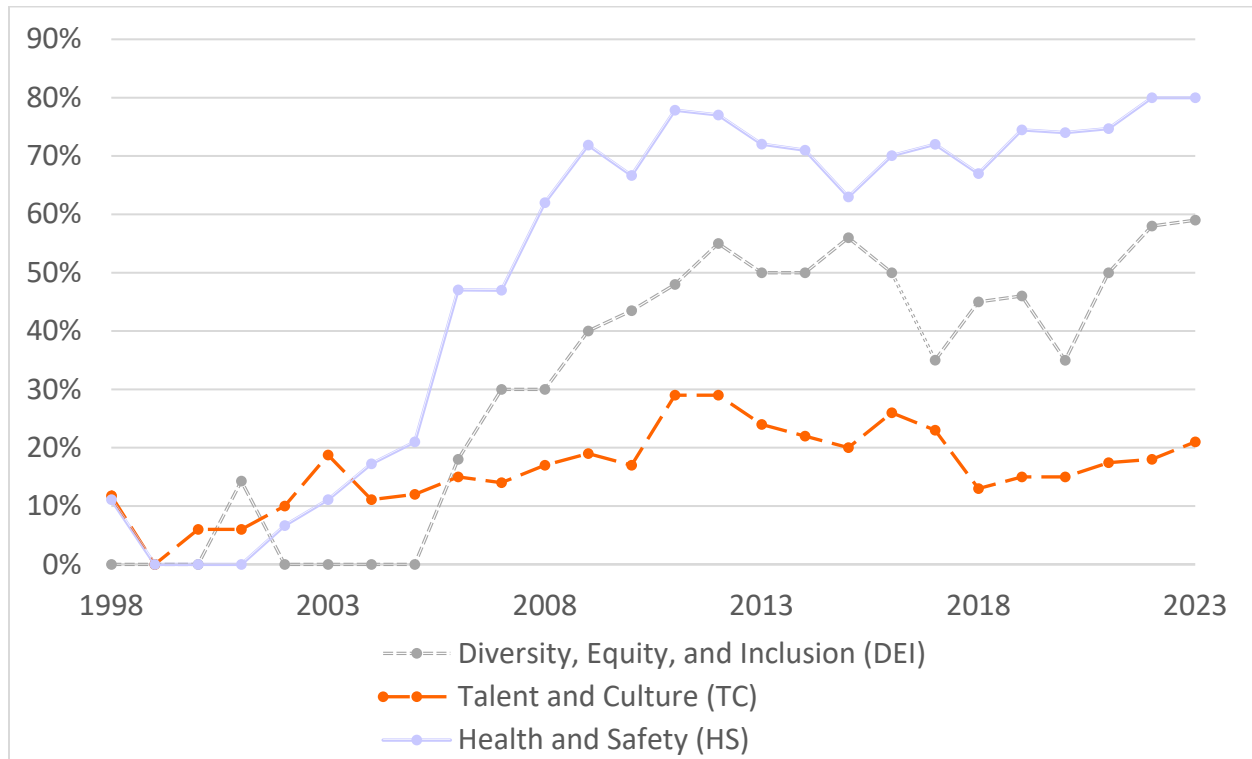


Figure 5 presents the time series trend of the percentage of HC plans having quantitative HC metrics in CEO performance plans across the three types of HC metrics from 1998 to 2023. The sample includes all plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1. Quantitative metrics refer to metrics that employ numerical targets.

**Figure 6. CEO Human Capital Performance Plan Values by Human Capital Metric Type, 1998-2023**

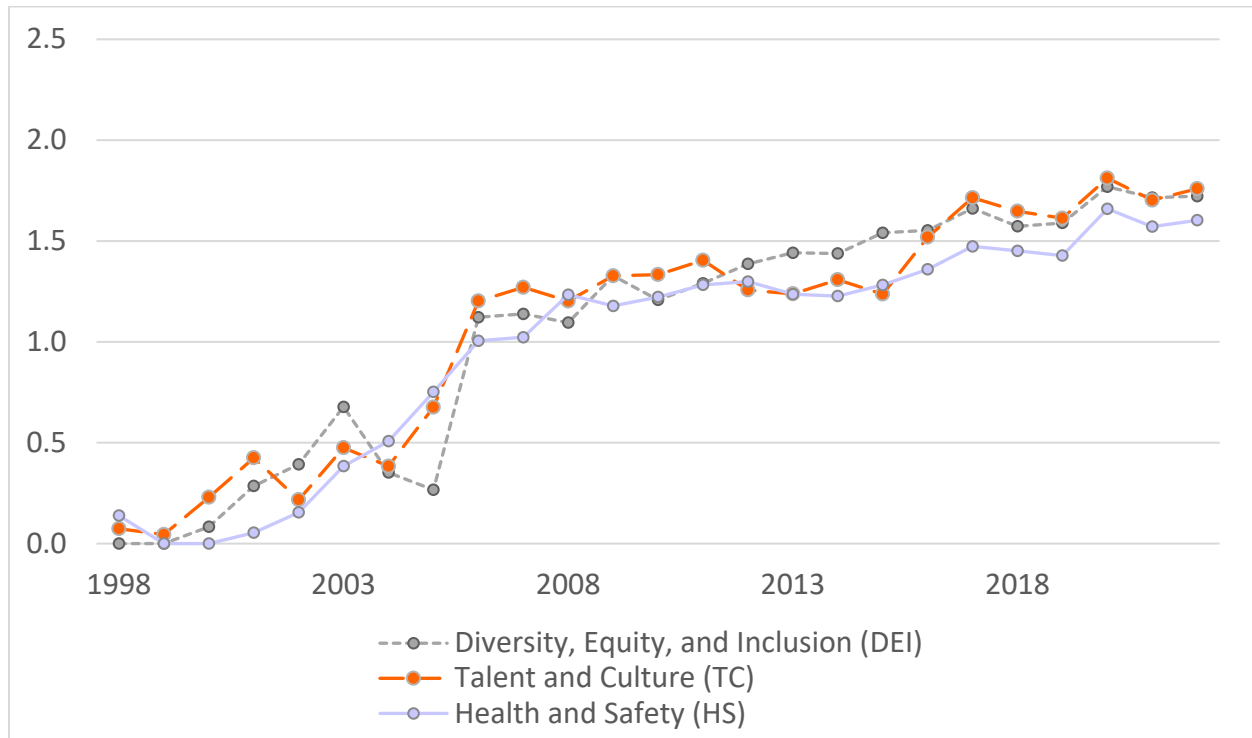


Figure 6 presents the time-series trend in total plan values (scaled by CEO salary) of CEO performance plans with HC metrics across the three types of HC metric types from 1998 to 2023. The sample includes all plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1. For each firm-year, total plan value is computed by summing the values of all CEO performance plans that include HC metrics.

Table 1. Summary Statistics

Panel A presents the plan-level summary statistics for all CEO performance plans covered in the Incentive Lab database that meet our sample selection criteria described in Section 2.1. Panel B presents the summary statistics for HC plan and firm variables at the firm-year level. Panel C presents the univariate comparison of firm characteristics before and after 2107. Variable definitions are in Appendix B. All continuous variables are winsorized at the 1% and 99% levels. The sample period is from 1998 to 2023.

Panel A. Summary statistics at the plan level

	N	Mean	Std Dev.	Min	Median	Max
HC Metric (0/1)	45,585	0.123	0.328	0.000	0.000	1.000
Other ESG Metrics (0/1)	45,585	0.039	0.195	0.000	0.000	1.000
<i><u>Characteristics of Human Capital Plans:</u></i>						
ST-Plan (0/1)	5,600	0.952	0.214	0.000	1.000	1.000
HS Metric (0/1)	5,600	0.376	0.484	0.000	0.000	1.000
DEI Metric (0/1)	5,600	0.143	0.350	0.000	0.000	1.000
TC Metric (0/1)	5,600	0.682	0.466	0.000	1.000	1.000
HC-Based Pay/Salary	5,212	1.616	1.231	0.221	1.300	8.679
HS-Based Pay/Salary	1,957	1.410	0.954	0.329	1.226	7.320
DEI-Based Pay/Salary	750	1.976	2.040	0.196	1.500	17.556
TC-Based Pay/Salary	3,523	1.692	1.405	0.220	1.400	10.717
HC-Quantitative (0/1)	5,600	0.359	0.480	0.000	0.000	1.000
HS-Quantitative (0/1)	2,104	0.624	0.484	0.000	1.000	1.000
DEI-Quantitative (0/1)	801	0.431	0.495	0.000	0.000	1.000
TC-Quantitative (0/1)	3,822	0.176	0.381	0.000	0.000	1.000

*(Table 1 continued.)*

Table 1 continued.

Panel B. Summary statistics at the firm-year level

	N	Mean	Std Dev.	Min	Median	Max
<u>CEO incentive variables:</u>						
HC Metric (0/1)	22,053	0.203	0.402	0.000	0.000	1.000
HS Metric (0/1)	22,053	0.079	0.269	0.000	0.000	1.000
DEI Metric (0/1)	22,053	0.032	0.176	0.000	0.000	1.000
TC Metric (0/1)	22,053	0.139	0.346	0.000	0.000	1.000
HC-Quantitative (0/1)	22,053	0.075	0.263	0.000	0.000	1.000
CEO ST Incentives/Salary	21,924	1.828	2.484	0.000	1.241	17.925
<u>Firm characteristics:</u>						
Employee (000s)	22,053	23.513	36.309	0.135	9.200	185.800
Firm Age	22,053	27.697	17.082	1.000	25.000	61.000
CapEx-to-Assets	22,053	0.046	0.050	0.000	0.031	0.283
R&D-to-Assets	22,053	0.030	0.064	0.000	0.000	0.375
Stock Volatility	22,053	0.023	0.011	0.008	0.020	0.063
Annual Stock Return	22,053	0.153	0.356	-0.970	0.158	1.246
ROA	22,053	0.133	0.109	-0.250	0.123	0.496
Revenue/Employees (\$M)	22,053	0.415	0.542	0.029	0.238	3.626
Intangible Capital/Employees (\$M)	21,990	0.382	0.565	0.000	0.202	3.550
InstOwnPct	22,053	0.735	0.243	0.000	0.807	0.997
SOP VotedForPct	6,398	0.727	0.137	0.199	0.754	0.953

Panel C. Univariate comparison of firm characteristics before 2018 vs. 2018 onward

	<u>Before 2018</u>			<u>2018 and onward</u>			Mean Diff.	Median Diff.
	N	Mean	Median	N	Mean	Median		
Employees	16,420	22.162	8.500	5,633	27.452	11.300	5.290***	2.800***
Firm Age	16,420	25.979	23.000	5,633	32.705	29.000	6.727***	6.000***
CapEx-to-Assets	16,420	0.049	0.033	5,633	0.036	0.024	-0.012***	-0.009***
R&D-to-Assets	16,420	0.030	0.000	5,633	0.029	0.000	-0.002*	0.000
Stock Volatility	16,420	0.023	0.020	5,633	0.024	0.021	0.001***	0.001***
Annual Stock Return	16,420	0.156	0.160	5,633	0.143	0.152	-0.013**	-0.008**
ROA	16,420	0.137	0.128	5,633	0.120	0.112	-0.017 ***	-0.016 ***
Revenue/Employees (\$M)	16,420	0.406	0.239	5,633	0.442	0.235	0.036***	-0.004
Intangible Assets/Employees (\$M)	16,369	0.332	0.173	5,621	0.527	0.300	0.195***	0.127***
InstOwnPct	16,420	0.718	0.789	5,633	0.783	0.846	0.065***	0.057***
SOP VotedForPct	3,318	0.725	0.751	3,080	0.728	0.757	0.003	0.006

Table 2. Correlation Matrix for Variables Used in Analysis of Determinants of HC Plan Adoption

This table presents the correlation matrix between variables using data at the firm-year level (n = 22,053). All variable definitions are in Appendix B. The sample period is from 1998 to 2023. We present the statistical significance (*p*-values) in parentheses.

Variables	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(a) HC Plan (0/1)	-									
(b) ln(Employees)	0.012 (0.083)									
(c) ln(Firm Age)	0.105 (0.000)	0.354 (0.000)								
(d) CapEx-to-Assets	0.016 (0.017)	-0.075 (0.000)	-0.090 (0.000)							
(e) R&D-to-Assets	-0.049 (0.000)	-0.315 (0.000)	-0.215 (0.000)	-0.016 (0.018)						
(f) Stock Volatility	-0.012 (0.077)	-0.246 (0.000)	-0.256 (0.000)	0.109 (0.000)	0.209 (0.000)					
(g) Annual Stock Return	-0.023 (0.001)	-0.048 (0.000)	-0.047 (0.000)	0.001 (0.920)	0.057 (0.000)	-0.064 (0.000)				
(h) ROA	-0.060 (0.000)	0.171 (0.000)	0.039 (0.000)	0.303 (0.000)	-0.195 (0.000)	-0.171 (0.000)	0.120 (0.000)			
(i) ln(Revenue/Employees)	0.154 (0.000)	-0.374 (0.000)	0.025 (0.000)	0.013 (0.049)	-0.114 (0.000)	-0.083 (0.000)	0.003 (0.605)	0.111 (0.000)		
(j) ln(Int. Assts/Employees)	0.097 (0.000)	-0.273 (0.000)	-0.074 (0.000)	-0.206 (0.000)	0.354 (0.000)	-0.012 (0.079)	-0.013 (0.054)	-0.167 (0.000)	0.290 (0.000)	
(k) InstOwnPct	0.054 (0.000)	0.061 (0.000)	0.037 (0.000)	-0.016 (0.018)	0.043 (0.000)	-0.096 (0.000)	0.057 (0.000)	0.075 (0.000)	-0.045 (0.000)	0.062 (0.000)

Table 3. Determinants of the Adoption of Human Capital Performance Plans

This table presents regression results of the likelihood of adopting at least one HC plan for the CEO in a given firm-year. The dependent variable is a binary variable that equals one if the firm has adopted one or more HC plans in a given firm-year. Variable definitions are in Appendix B. Industry fixed effects are based on Fama–French 12 or 49 industries. Panel A reports results with no fixed effects or year fixed effects, Panel B reports results with industry fixed effects, and Panel C reports results based on the alternative human capital importance proxy, *ln(Intangible Capital/Employees)*. t-statistics (in parentheses) are based on robust standard errors clustered at the firm level. \*, \*\*, \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The sample period is 1998 to 2023.

Panel A. Models without industry fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable: HC Metric (0/1)							
ln(Employees)	-0.016*** (-3.98)	-0.014*** (-3.47)	0.005 (0.98)	-0.016*** (-3.88)	-0.032*** (-3.69)	0.008* (1.66)	0.003 (0.26)
ln(Firm Age)	0.025*** (3.51)	0.023*** (3.30)	0.017** (2.54)	0.029*** (4.00)	0.036* (1.79)	0.018*** (2.73)	0.029 (1.52)
CapEx-to-Assets	0.546*** (5.11)	0.726*** (6.28)	0.538*** (5.11)	0.502*** (4.83)	0.654** (2.45)	0.701*** (6.34)	0.846*** (2.98)
R&D-to-Assets	-0.318*** (-4.12)	-0.364*** (-4.67)	-0.107 (-1.37)	-0.280*** (-3.72)	-0.483** (-2.24)	-0.127* (-1.67)	-0.213 (-1.01)
Stock Volatility	-0.242 (-0.37)	-0.840 (-1.25)	0.823 (1.29)	-0.753* (-1.72)	-1.947 (-1.17)	-0.383 (-0.89)	-0.503 (-0.40)
Annual Stock Return		-0.011 (-1.55)				-0.004 (-0.64)	-0.067*** (-3.73)
ROA		-0.252*** (-5.16)				-0.286*** (-6.19)	-0.405*** (-3.32)
ln(Revenue/Employees)			0.070*** (8.78)			0.071*** (8.95)	0.089*** (5.32)
InstOwnPct				0.015 (0.73)		0.036* (1.79)	0.059 (1.25)
Post-2017 Indicator				0.315*** (23.64)		0.305*** (22.78)	0.273*** (13.12)
Post-2020 Indicator				0.107*** (9.01)		0.108*** (9.11)	0.097*** (5.92)
SOP VotedForPct					-0.283*** (-3.94)		-0.178*** (-2.69)
Industry fixed effects	No	No	No	No	No	No	No
Year fixed effects	Yes	Yes	Yes	No	Yes	No	No
Observations	22,053	22,053	22,053	22,053	6,398	22,053	6,398
R-squared	0.173	0.177	0.190	0.170	0.145	0.193	0.176

(Table 3 continued.)

Table 3 continued.

Panel B. Models with industry fixed effects

	<u>Without SOP</u>		<u>With SOP</u>		<u>Without SOP</u>		<u>With SOP</u>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable: HC Metric (0/1)							
ln(Employees)	0.016*** (3.45)	0.017*** (3.46)	0.015 (1.64)	0.016* (1.66)	0.016*** (3.50)	0.017*** (3.52)	0.015 (1.62)	0.017* (1.68)
ln(Firm Age)	-0.000 (-0.06)	-0.002 (-0.36)	0.007 (0.41)	0.006 (0.35)	-0.004 (-0.64)	-0.006 (-1.02)	0.006 (0.34)	0.004 (0.24)
CapEx-to-Assets	-0.070 (-0.61)	-0.072 (-0.62)	-0.143 (-0.50)	-0.182 (-0.63)	-0.058 (-0.50)	-0.045 (-0.39)	-0.129 (-0.45)	-0.152 (-0.52)
R&D-to-Assets	0.075 (0.84)	0.096 (1.07)	-0.117 (-0.45)	-0.107 (-0.41)	0.054 (0.60)	0.076 (0.84)	-0.120 (-0.46)	-0.107 (-0.41)
Stock Volatility	0.191 (0.51)	0.083 (0.24)	0.659 (0.57)	0.575 (0.52)	1.450** (2.53)	1.387** (2.58)	0.391 (0.25)	0.274 (0.18)
Annual Stock Return	-0.005 (-0.85)	-0.006 (-0.90)	-0.064*** (-3.81)	-0.058*** (-3.47)	-0.011 (-1.55)	-0.011 (-1.59)	-0.078*** (-4.06)	-0.072*** (-3.76)
ROA	-0.139*** (-3.10)	-0.129*** (-2.87)	-0.234** (-1.99)	-0.206* (-1.76)	-0.097** (-2.13)	-0.079* (-1.74)	-0.221* (-1.85)	-0.194 (-1.64)
ln(Revenue/Employees)	0.037*** (4.65)	0.039*** (4.49)	0.049*** (2.90)	0.069*** (3.68)	0.035*** (4.46)	0.035*** (4.07)	0.050*** (2.96)	0.070*** (3.74)
InstOwnPct	0.057*** (2.88)	0.059*** (2.96)	0.058 (1.24)	0.071 (1.48)	0.025 (1.23)	0.026 (1.25)	0.058 (1.22)	0.070 (1.45)
Post-2017 Indicator	0.304*** (22.99)	0.305*** (23.14)	0.263*** (12.82)	0.262*** (13.01)				
Post-2020 Indicator	0.107*** (8.97)	0.106*** (8.95)	0.098*** (5.99)	0.098*** (6.02)				
SOP VotedForPct			-0.135** (-2.08)	-0.084 (-1.41)			-0.140** (-2.14)	-0.088 (-1.46)
Industry fixed effects	FF-12	FF-49	FF-12	FF-49	FF-12	FF-49	FF-12	FF-49
Year fixed effects	No	No	No	No	Yes	Yes	Yes	Yes
Observations	22,053	22,053	6,398	6,398	22,053	22,053	6,398	6,398
R-squared	0.232	0.242	0.221	0.249	0.237	0.247	0.218	0.246

(Table 3 continued.)

Table 3 continued.

Panel C. Models with alternative human capital importance proxy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable: HC Metric (0/1)							
ln(Employees)	-0.014*** (-3.19)	-0.010** (-2.37)	-0.019** (-2.18)	0.011** (2.54)	0.012*** (2.62)	0.010 (1.11)	0.009 (0.96)
ln(Firm Age)	0.026*** (3.58)	0.027*** (3.86)	0.038* (1.91)	0.001 (0.20)	-0.002 (-0.29)	0.009 (0.49)	0.003 (0.18)
CapEx-to-Assets	0.601*** (5.61)	0.768*** (6.78)	1.083*** (3.69)	-0.079 (-0.70)	-0.071 (-0.62)	-0.038 (-0.13)	-0.083 (-0.28)
R&D-to-Assets	-0.392*** (-4.97)	-0.440*** (-5.61)	-0.619*** (-3.01)	-0.017 (-0.18)	0.017 (0.19)	-0.276 (-1.11)	-0.242 (-0.94)
Stock Volatility	-0.072 (-0.11)	-0.930** (-2.07)	-1.534 (-1.20)	0.211 (0.57)	0.092 (0.26)	0.530 (0.46)	0.285 (0.26)
Annual Stock Return		-0.004 (-0.57)	-0.062*** (-3.45)	-0.005 (-0.74)	-0.006 (-0.91)	-0.062*** (-3.69)	-0.056*** (-3.40)
ROA		-0.267*** (-5.68)	-0.412*** (-3.39)	-0.095** (-2.16)	-0.074* (-1.69)	-0.194* (-1.68)	-0.141 (-1.22)
InstOwnPct		0.025 (1.21)	0.039 (0.83)	0.057*** (2.84)	0.056*** (2.78)	0.055 (1.17)	0.059 (1.22)
ln(Intangible Cap./Employees)	0.056** (2.31)	0.074*** (3.14)	0.124*** (2.64)	0.075*** (3.30)	0.079*** (3.22)	0.127*** (2.73)	0.143*** (2.72)
Post-2017 Indicator		0.304*** (22.38)	0.279*** (13.36)	0.298*** (22.29)	0.301*** (22.50)	0.261*** (12.73)	0.261*** (12.88)
Post-2020 Indicator		0.106*** (8.84)	0.093*** (5.61)	0.104*** (8.72)	0.103*** (8.66)	0.094*** (5.73)	0.093*** (5.68)
SOP VotedForPct			-0.218*** (-3.05)			-0.142** (-2.11)	-0.105* (-1.71)
Industry fixed effects	No	No	No	FF 12	FF 49	FF 12	FF 49
Year fixed effects	Yes	No	No	No	No	No	No
Observations	21,990	21,990	6,398	21,990	21,990	6,398	6,398
R-squared	0.174	0.176	0.163	0.229	0.240	0.220	0.246



Table 4. Determinants of the Adoption of Human Capital Performance Plans — Subcategory Analysis

This table presents regression results of the likelihood of adopting at least one HC plan of a particular HC subcategory for the CEO in a particular firm-year. The dependent variable is a binary variable that equals one if, in a given year, the firm has one or more Healthy and Safety (HS) plans (models 1 and 4), DEI plans (models 2 and 5), and Talent and Culture (TC) plans (models 3 and 6), and zero if the firm has not adopted any type of HC plan in a given year. Variable definitions are given in Appendix B. Industry fixed effects are based on Fama–French 12 industry sectors. t-statistics in parenthesis are based on robust standard errors clustered at the firm level. \*, \*\*, \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The sample period is from 1998 to 2023.

	<u>Without SOP</u>			<u>With SOP</u>		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	HS (0/1)	DEI (0/1)	TC (0/1)	HS (0/1)	DEI (0/1)	TC (0/1)
ln(Employees)	0.009*** (2.78)	0.013*** (5.44)	0.009** (2.25)	0.015** (2.19)	0.024*** (4.47)	0.009 (0.97)
ln(Firm Age)	-0.002 (-0.47)	0.003 (1.07)	0.000 (0.06)	-0.003 (-0.17)	0.004 (0.39)	0.006 (0.33)
CapEx-to-Assets	0.054 (0.52)	-0.025 (-0.54)	-0.108 (-1.11)	0.184 (0.75)	-0.016 (-0.11)	-0.242 (-0.89)
R&D-to-Assets	-0.108** (-2.19)	0.050 (1.27)	0.162* (1.90)	-0.226 (-1.60)	-0.009 (-0.07)	0.081 (0.31)
Stock Volatility	0.736** (2.45)	0.014 (0.07)	-0.034 (-0.11)	2.977*** (2.97)	-0.158 (-0.19)	-0.781 (-0.72)
Annual Stock Return	0.004 (0.92)	0.004 (1.22)	-0.002 (-0.39)	-0.020 (-1.41)	-0.017 (-1.43)	-0.049*** (-3.06)
ROA	-0.162*** (-5.27)	-0.055*** (-2.77)	-0.029 (-0.72)	-0.252*** (-3.23)	-0.165** (-2.49)	-0.074 (-0.64)
ln(Revenue/Employees)	0.039*** (5.43)	0.013*** (4.11)	0.019*** (2.97)	0.064*** (5.07)	0.029*** (3.13)	0.032** (2.01)
InstOwnPct	0.032* (1.94)	0.008 (0.82)	0.044*** (2.64)	0.088*** (2.79)	0.017 (0.60)	0.016 (0.34)
Post-2017 Indicator	0.081*** (8.71)	0.036*** (5.51)	0.308*** (22.13)	0.030** (2.42)	0.038*** (3.83)	0.293*** (13.91)
Post-2020 Indicator	0.064*** (6.72)	0.180*** (12.84)	0.091*** (7.38)	0.053*** (4.39)	0.176*** (9.42)	0.077*** (4.64)
SOP VotedForPct				-0.097* (-1.72)	-0.086** (-2.49)	-0.101* (-1.76)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No
Observations	19,311	18,278	20,630	5,145	4,852	5,867
R-squared	0.266	0.149	0.210	0.375	0.180	0.191

Table 5. Determinants of Pay Values for Human Capital Plans

This table presents the regression results for the determinants of HC plan values, restricted to firm-years with non-missing and nonzero HC plan values. The dependent variable is the natural log value of the total plan values under a specific plan type divided by CEO salary. Model 1 presents results for HC plans, model 2 for Healthy and Safety (HS) plans, model 3 for DEI plans, and model 4 for Talent and Culture (TC) plans. Variable definitions are in Appendix B. Industry fixed effects are based on Fama–French 12 industry sectors. t-statistics in parenthesis are based on robust standard errors clustered at the firm level. \*, \*\*, \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The sample period is from 1998 to 2023.

	(1)	(2)	(3)	(4)
Dependent Variable:	ln(HC Plan Value/Salary)	ln(HS Plan Value/Salary)	ln(DEI Plan Value/Salary)	ln(TC Plan Value/Salary)
ln(Employees)	0.137*** (9.61)	0.136*** (7.92)	0.134*** (8.08)	0.139*** (8.70)
ln(Firm Age)	0.015 (1.03)	0.012 (0.72)	0.010 (0.28)	-0.002 (-0.14)
CapEx-to-Assets	-0.433* (-1.65)	0.106 (0.36)	1.124** (2.20)	-0.683** (-2.01)
R&D-to-Assets	-0.526** (-2.44)	1.489 (0.71)	-0.250 (-0.45)	-0.414** (-2.05)
Stock Volatility	2.652** (2.43)	3.732*** (2.81)	-1.625 (-0.80)	1.547 (1.27)
Annual Stock Return	0.004 (0.16)	-0.010 (-0.40)	0.100* (1.80)	0.004 (0.17)
ROA	-0.169 (-0.99)	-0.518*** (-2.94)	-0.831*** (-2.61)	0.004 (0.02)
ln(Revenue/Employees)	0.163*** (8.23)	0.143*** (6.30)	0.131*** (4.04)	0.164*** (6.81)
InstOwnPct	0.012 (0.20)	0.003 (0.04)	-0.073 (-0.64)	0.001 (0.02)
Post-2017 Indicator	0.168*** (6.56)	0.148*** (4.99)	0.301*** (5.39)	0.168*** (5.02)
Post-2020 Indicator	0.037** (2.19)	0.060** (2.55)	-0.003 (-0.10)	0.007 (0.41)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No
Observations	4,208	1,627	664	2,849
R-squared	0.236	0.234	0.406	0.272

Table 6. CEO Total Short-Term Incentive Pay and HC Plans

This table presents regression results of CEO total short-term incentive pay on HC plan indicators. The dependent variable equals the natural log value of one plus the total value of all CEO short-term performance plans divided by CEO salary. Variable definitions are in Appendix B. Industry fixed effects are based on Fama–French 12 industry sectors. t-statistics in parenthesis are based on robust standard errors clustered at the firm level. Other metric controls include indicator variables capturing whether the CEO performance plans granted in that year include stock-price-based, earnings-based, cash-flow-based, sales-based financial metrics, and/or other non-HC ESG-related metrics. \*, \*\*, \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The sample period is from 1998 to 2023.

Panel A. Results for entire sample

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	ln(1+ CEO ST Incentives/Salary)				
HC Plan (0/1)	0.013 (0.87)				
HS Plan (0/1)		0.008 (0.43)			-0.003 (-0.13)
DEI Plan (0/1)			0.083*** (2.76)		0.083*** (2.71)
TC Plan (0/1)				0.008 (0.48)	0.003 (0.21)
Controls	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Other metric controls	Yes	Yes	Yes	Yes	Yes
Observations	21,650	21,650	21,650	21,650	21,650
R-squared	0.129	0.129	0.129	0.129	0.129

Panel B. Results for entropy balanced sample

	(1)	(2)	(3)	(4)
Dependent Variable:	Ln(1+ CEO ST Incentives/Salary)			
HC Plan (0/1)	0.023 (1.63)			
HS Plan (0/1)		0.000 (0.02)		
DEI Plan (0/1)			0.114*** (3.56)	
TC Plan (0/1)				0.012 (0.76)
Controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Other metric controls	Yes	Yes	Yes	Yes
Observations	21,650	21,650	21,650	21,650
R-squared	0.133	0.122	0.198	0.129

(Table 6 continued.)

Table 6 continued.

Panel C: Results for First HC Plan Adoption Sample

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	ln(1+ CEO ST Incentives/Salary)				
First HC Adoption (0/1)	0.007 (0.37)				
First HS Adoption (0/1)		0.020 (0.85)			-0.019 (-0.80)
First DEI Adoption (0/1)			0.079*** (2.65)		0.113*** (2.61)
First TC Adoption (0/1)				0.013 (0.64)	0.001 (0.05)
Controls	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Other metric controls	Yes	Yes	Yes	Yes	Yes
Observations	17,268	20,079	20,838	18,143	17,268
R-squared	0.123	0.129	0.126	0.122	0.124

Table 7. CEO Total Short-Term Incentive Pay and HC Plans — Analysis of Metric and Plan Characteristics

This table presents regression results for CEO total short-term incentive pay on the presence of HC plans. The dependent variable equals the natural log value of one plus the total value of all short-term performance plans divided by CEO salary. Variable definitions are in Appendix B. Industry fixed effects are based on Fama–French 12 industry sectors. Other metric controls include indicator variables capturing whether the CEO performance plans granted in that year include stock-price-based, earnings-based, cash-flow-based, sales-based financial metrics, and/or other non-HC ESG-related metrics. t-statistics in parenthesis are based on robust standard errors clustered at the firm level. \*, \*\*, \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The sample period is 1998 to 2023.

Panel A. Use of quantitative vs. qualitative metrics

Dependent Variable:	(1)	(2)	(3)	(4)	(5)
	ln(1+ CEO ST Incentives/Salary)				
HC-Quantitative (0/1)	-0.009 (-0.55)				
HC-Qualitative (0/1)	0.021 (1.28)				
HS-Quantitative (0/1)		0.006 (0.31)			0.005 (0.25)
HS-Qualitative (0/1)		0.003 (0.11)			-0.022 (-0.84)
DEI-Quantitative (0/1)			-0.010 (-0.37)		-0.004 (-0.15)
DEI-Qualitative (0/1)			0.130*** (3.13)		0.133*** (3.11)
TC-Quantitative (0/1)				-0.027 (-1.08)	-0.029 (-1.17)
TC-Qualitative (0/1)				0.020 (1.16)	0.015 (0.89)
Controls	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Other metric controls	Yes	Yes	Yes	Yes	Yes
Observations	21,650	21,650	21,650	21,650	21,650
R-squared	0.129	0.128	0.130	0.129	0.130

*(Table 7 continued.)*

Table 7 continued.

Panel B. Use of multiple metrics and multiple metric types

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ln(1+CEO Short-Term Pay/Salary)					
Multiple HC Metrics (0/1)	0.054** (2.50)					
Single HC Metric (0/1)	-0.003 (-0.17)					
Multiple HC Metric Types (0/1)		0.055** (2.15)				
Single HC Metric Type (0/1)		0.005 (0.31)				
Number of HS Metrics			-0.000 (-0.07)			-0.004 (-0.63)
Number of DEI Metrics				0.034* (1.90)		0.030* (1.66)
Number of TC Metrics					0.023* (1.66)	0.021 (1.50)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Other metric controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,650	21,650	21,650	21,650	21,650	21,650
R-squared	0.129	0.129	0.128	0.129	0.129	0.129

Table 8. Firm Financial Performance Following HC Plan Adoptions

This table reports regression estimates of post-adoption firm performance following the adoption of human-capital (HC) plans. The dependent variables are ROA (Panels A and C) and annual stock returns (Panels B and D) measured in years 0, 1, and 2 after HC plan adoption. Panels C and D use the entropy-balanced sample. Variable definitions are in Appendix B. Industry fixed effects are based on Fama–French 12 industry sectors. Other metric controls include indicator variables capturing whether the CEO performance plans granted in that year include stock-price-based, earnings-based, cash-flow-based, sales-based financial metrics, and/or other non-HC ESG-related metrics. t-statistics in parenthesis are based on robust standard errors clustered at the firm level. \*, \*\*, \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The sample period is 1998 to 2023.

Panel A. ROA results for entire sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Dependent Variable: ROA														
	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2
HC Plan (0/1)	-0.001 (-0.52)	0.000 (0.35)	-0.001 (-0.54)												
HS Plan (0/1)				-0.001 (-0.40)	-0.001 (-0.42)	-0.002 (-1.13)							0.000 (0.06)	-0.001 (-0.85)	-0.002 (-1.02)
DEI Plan (0/1)							-0.008** (-2.52)	0.004 (1.56)	-0.003 (-1.37)				-0.009** (-2.51)	0.004 (1.55)	-0.003 (-1.28)
TC Plan (0/1)										0.001 (0.61)	0.002 (1.17)	0.001 (1.02)	0.001 (0.95)	0.001 (1.05)	0.001 (1.24)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other metric controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,505	21,040	19,739	21,505	21,040	19,739	21,505	21,040	19,739	21,505	21,040	19,739	21,505	21,040	19,739
R-squared	0.722	0.707	0.701	0.722	0.707	0.701	0.722	0.707	0.701	0.722	0.707	0.701	0.722	0.707	0.701

(Table 8 continued.)

Table 8 continued.

Panel B. Stock return results for entire sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Dependent Variable: Annual Stock Return														
	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2
HC Plan (0/1)	-0.007 (-1.22)	-0.008 (-1.11)	-0.007 (-0.94)												
HS Plan (0/1)				-0.002 (-0.22)	-0.023** (-1.97)	-0.023** (-2.00)							-0.003 (-0.33)	-0.026** (-2.18)	-0.024** (-2.05)
DEI Plan (0/1)							0.009 (0.90)	0.007 (0.51)	-0.004 (-0.32)				0.011 (0.98)	0.011 (0.79)	0.000 (0.00)
TC Plan (0/1)										-0.003 (-0.45)	0.010 (1.28)	0.005 (0.62)	-0.003 (-0.52)	0.012 (1.42)	0.007 (0.83)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,853	20,780	19,597	20,853	20,780	19,597	20,853	20,780	19,597	20,853	20,780	19,597	20,853	20,780	19,597
R-squared	0.507	0.171	0.165	0.507	0.171	0.165	0.507	0.171	0.164	0.507	0.171	0.165	0.507	0.171	0.165

Panel C. ROA results for entropy-balanced sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent Variable: ROA											
	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2
HC Plan (0/1)	0.002 (1.00)	0.000 (0.34)	-0.000 (-0.41)									
HS Plan (0/1)				-0.001 (-0.54)	-0.001 (-0.38)	-0.002 (-1.08)						

*(Table 8 continued.)*



Table 8 continued.

DEI Plan (0/1)							-0.008***	0.004	-0.003*			
							(-3.02)	(1.64)	(-1.67)			
TC Plan (0/1)										0.001	0.001	0.001
										(1.00)	(0.46)	(0.86)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,505	21,040	19,739	21,505	21,040	19,739	21,505	21,040	19,739	21,505	21,040	19,739
R-squared	0.668	0.651	0.630	0.487	0.430	0.413	0.627	0.652	0.678	0.709	0.697	0.684

Panel D. Stock return results for entropy-balanced sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent Variable: Stock Return											
	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2
HC Plan (0/1)	0.001	-0.003	0.004									
	(0.18)	(-0.35)	(0.51)									
HS Plan (0/1)				0.005	-0.018	-0.013						
				(0.66)	(-1.27)	(-0.99)						
DEI Plan (0/1)							-0.002	-0.003	-0.016			
							(-0.23)	(-0.21)	(-1.24)			
TC Plan (0/1)										-0.004	0.011	0.008
										(-0.67)	(1.35)	(0.98)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,853	20,780	19,597	20,853	20,780	19,597	20,853	20,780	19,597	20,853	20,780	19,597
R-squared	0.502	0.157	0.148	0.570	0.208	0.214	0.509	0.178	0.159	0.490	0.155	0.142

## **Appendix A. Human Capital-Based Compensation Plans Coding Guidelines**

### **A.1. Coding outline**

Step 1: We first separate financial from non-financial metrics using ISS variable “metrictype”. We classify a metric as non-financial if ISS variable “metrictype” equals “CSR”, “Environment”, “Non-Financial”, “Social”, or “Other”. Note that the variable “metrictype” is considered the broadest classification of each metric in ISS database.

Step 2: To further refine the set of non-financial metrics, we apply filters based on the ISS variable “metric,” which offers more granularity than “metrictype” but is categorized differently for fiscal years before and after 2018. For fiscal years prior to 2018, a metric is classified as non-financial if the “metric” variable is coded as “csr,” “diversity,” “environmental protection,” “individual,” “non-financial,” “other,” “staff health and safety,” “staff relations, engagement and training,” or “vague.” For fiscal years 2018 and onward, a metric is classified as non-financial if the “metric” variable equals “climate change and energy use,” “csr,” “diversity,” “environmental protection,” “individual,” “labor condition in supply chain,” “non-financial,” “other,” “society and human rights,” “staff health and safety,” “staff relations, engagement and training,” or “vague.”

Step 3: To further refine the set of non-financial metrics, we examine the ISS variable “MetricOther,” which offers a brief textual description (from proxy statements) of each metric’s focus. A metric is NOT classified as non-financial if its “MetricOther” entry meets one or more of the following criteria:

- “MetricOther” is missing
- “MetricOther” equals “unknown”
- “MetricOther” is about “company performance”
- “MetricOther” is about “business environment”
- “MetricOther” is about “management objective”
- “MetricOther” is about “management performance”
- “MetricOther” is about “management construction”
- “MetricOther” is about “management risk”
- “MetricOther” is about “strategic milestone”

Applying this filtering step, yields a set of 11,272 unique non-financial metrics.

Step 4: Lastly, we manually review all 11,272 unique non-financial metrics to ensure classification accuracy. This process eliminates 419 metrics, yielding a final sample of 10,853 non-financial compensation plan metrics.

In subsequent steps, these 10,853 non-financial compensation plan metrics are further categorized into four groups: “Human Capital,” “Governance,” “Environmental,” and “Broad ESG,” with our primary focus being the “Human Capital” category.

Step 5: In this step, we evaluate all 10,853 ISS Non-Financial Metrics to identify Human Capital Metrics. Here, we again rely on the ISS variable “MetricOther” and manually review its value following the rules and keywords described in the subsequent sections. Once a metric is identified

as a human capital metric, we set “primary type” of the metric= “Human Capital” then further classify it into one of three subcategories (note that the subcategories are not mutually exclusive):

- Health and Safety
- Diversity, Equity, and Inclusion
- Talent and Culture

## A.2. Keywords and rules for HC metrics

To classify a metric as “Health & Safety (HS)”, we require the following:

- Inclusion of one or more of the following keywords in “MetricOther”:  
“Health\*”, “Safe\*”, “injur\*”, “inciden\*”, “emergency response”, “accident”, “wellness” + “employee”, “dart” (Days Away, Restricted, or Transferred), “trr” (Total Recordable Incident Rate), “lwcr” (Lost Workday Case Rate), “hse”( Health, Safety, and Environmental (HSE)); “hs&e”; “ehs”; “eh&s”; “fatalit\*”; “damage prevention”; “collision”; “osha”, “lces” (Lookouts, Communications, Escape Routes, and Safety Zones); “irr” (Injury/Illness Incident Rate); “lost workday”; “human performance event”; “lost time”; “FSI”( Field Safety Index); “NSC”( National Safety Council); “total preventable recordable rate”; “days”+“away”; “life changing”; “fatigue”; “critical control”; “total recordable”; “LCE”( “lces” (Lookouts, Communications, Escape Routes); “wire-down”; “stretching”; “SIF” (serious incident & fatality); “severity”; “containment”; “lone worker technology”; “fire ignitions”; “trir”; “ticr”; “iir”; “employee”+“release”; “human error releases”; “palo verde”
- Metric= “staff health” and “MetricOther” contains the following keywords:
  - “operational and values”, “operating errors” “exposure reduction”; “regulatory and environmental events”; “care”; “tier”; “she”; “zero harm”; “gas”; “hazard”
- Exceptions:
  - “healthy planet” for Walgreens Boots Alliance, Inc. in 2023; “healthcare events”; “launch four healthcare compliance online modules”; “healthcare compliance improvement plan”; “black maternal health” for Anthem, Inc. in 2021; “associate support of community health services” for Anthem, Inc. in 2021; “customer service and safety”; “environmental safety”; “safety - environmental stewardship”; “emphasize the significance of achieving compliance safeguarding the environment protection”; “safeguard”; “environmental incident”; “nerc compliance - reduction in nerc compliance incidents”; “environmental severity rate (spills) (produced fluid release rate (pfr))”; “total recordable environmental rate”

To classify a metric as “Diversity, Equity, and Inclusion (DEI)”, we require the following:

- Inclusion of one or more of the following keywords in “MetricOther”:  
“Diversity”, “Equity”, “Inclusion” or “DEI”, “inclusive “, “diverse”, “de&i”, “d&I”, “i&d”, “female”; “multicultural”; “execute diversification initiatives”; “i&d initiatives”; “women”; “underrepresented”; “of color”; “representation”; “gender”; “diversify and grow”; “urm”; “black”; “veterans”; “minorit\*”; “dib”; “erg”

- Metrictype="social" + metric="diversity" and "MetricOther" contains the following keywords:
  - "esg", "social"
- Exceptions:
  - "equity renewable fuels production (mbpd)" for Chevron Corporation in 2023 is classified as "environmental" because it appears to be a typo in Incentive Lab.

To classify a metric as "Talent and Culture (TC)", we require the following:

- Inclusion of one or more of the following keywords in "MetricOther":  
"individual", "person\*", "people", "employee", "talent", "human", "Mindset", "ethic\*",  
"integrity", "culture", "tone at the top", "retention", "staff"; "enps" (Employee Net Promoter Score); "succession", "labor", "workforce", "team"; "training"; "workgroup";  
"colleague"; "engagement"; "leader\*"; "recruit"; "ferc compliance"; "volunteer\*"; "best place to work"; "co-workers"; "community involvement"; "community index"; "building and maintain investment community credibility"; "mentoring"; "cultural"; "high-perform"; "retain"; "attrition"; "opportunity index"; "organizational education achievements"; "mentor"; "associate experience"; "launch and define internal esg committee"; "engage"+"modifier"; "scorecard"; "ability to manage"; "consistency among members of the management team"; "turnover"; "2019 key performance indicators" (for PDC Energy, Inc.), "compliance" + metric="individual"; "building and maintaining investment community credibility"
- Exceptions:
  - "personal" + subcategory1="health and safe"; "peoples gas"; "people of color"; "people : racial/ethnic diversity representation"; "people : female representation"; "people diversity equity and inclusion"; "people safety"; culture diversity and inclusion; "diverse and inclusive culture"; culture diversity equity; culture that values diversity equality; culture of inclusion; culture + subcategory1="health and safety"; "employee" + subcategory1="dei" or "health and safety"; "promote the long-term diversity of staff members"; "developing diverse talent", "development of diverse talent"; "human" + subcategory1="dei" or "health and safety"; "human rights"; "human error releases"; "integrity" + subcategory1="health and safety"; "student retention"; "staff" + + subcategory1="dei"; "workforce diversity" or "diverse workforce"; "diverse leadership team"; "employee engagement survey scores for inclusion index"; "diversity inclusion belonging and engagement"; Engagement + subcategory1="health and safety"; "strategic objectives (recruitment & retention of a diverse workforce)"; "emphasize diversity in hiring retention & promotion"; "improve attraction promotion and retention of females in leadership roles."; "leadership" + "environmental"; "leadership" + subcategory1="dei"; "financial controls compliance leadership and corporate responsibility"; "improve our culture of inclusion and the attraction promotion and retention of women in l"; "focus on attracting developing engaging retaining and rewarding a diverse employee base"; "reduction of the voluntary attrition of

underrepresented groups”; “voluntary turnover of women and ethnic minorities”; “scorecard” + subcategory1=”dei” or “health and safety”

### **A.3. Cases requiring special attention:**

#### risk

- If there are other keywords combined with risk, the category is classified based on the other keywords. For example, “safety- risk level 3 events” is “health and safety” under “human capital”. When it is risk by itself, it is classified based on “metric”.

#### community

- Addressing whether the word “community” suggests use of a human capital metric – e.g. “Discharge to Community” is classified as an “other” non-financial performance for a healthcare company; “Community Count” for housing developers is not an HC metric but “Community Associate Turnover” is an HC metric. Vague mentions of Community are not classified as HC, for example, “Community Events” is classified as Broad ESG, not HC.

#### placement

- In total, we have 17 cases where “placement” appears in the “metric” variable. Only instances which contain “diversity” + “placement” are classified as “human capital” – “DEI”. The other cases are classified either as “other” or environmental.

#### volunteer\*

- Only explicit mention of employee volunteering is treated as an HC metric.

#### health/safety or DEI along with training

- Metric is classified as either HS and TC or DEI and TC.

#### leadership

- 222 metrics contain “leader\*”. Among them, 17 contain “environmental leadership”, and thus are classified as “environmental” rather than HC. The rest are classified as HC and within HC as Talent and Culture.

## Appendix B. Variable Definitions

Variable Name	Data Source	Variable Definition
HC Plan (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains human-capital metric(s), 0 otherwise.
HS Plan (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains health and safety metric(s), 0 otherwise.
DEI Plan (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains DEI metric(s), 0 otherwise.
TC Plan (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains talent and culture metric(s), 0 otherwise.
HC – Quantitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains quantitative human capital metric(s), 0 otherwise.
HC – Qualitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains qualitative human capital metric(s), 0 otherwise.
HS – Quantitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains quantitative health and safety metric(s), 0 otherwise.
HS – Qualitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains qualitative health and safety metric(s), 0 otherwise.
DEI – Quantitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains quantitative diversity, equity, and inclusion metric(s), 0 otherwise.
DEI – Qualitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains qualitative diversity, equity, and inclusion metric(s), 0 otherwise.
TC – Quantitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains quantitative talent and culture metric(s), 0 otherwise.
TC – Qualitative (0/1)	ISS Incentive Lab and manual coding	1 if a firm-year has at least one CEO performance plan that contains qualitative talent and culture metric(s), 0 otherwise.

HC Plan Value/Salary	ISS Incentive Lab	Sum of all HC plan pay values (cash and equity) for a firm-year scaled by that year's CEO's salary.
CEO ST Incentives /Salary	ISS Incentive Lab	Sum of all short-term plan pay values (cash and equity) for a firm-year scaled by that year's CEO's salary.
Employees	COMPUSTAT	The number of employees for a firm-year ( <i>in 000s</i> ).
Firm Age	COMPUSTAT	The number of years since the firm first appear in COMPUSTAT (first non-missing PRCC_F in COMPUSTAT).
CapEx-to-Assets	COMPUSTAT	Capital expenditures scaled by total assets for the previous year.
Stock Volatility	CRSP	Standard deviation of daily stock returns for the fiscal year.
Annual Stock Return	CRSP	Cumulative monthly stock return for the fiscal year.
ROA	COMPUSTAT	Operating income before depreciation scaled by total assets for the previous year.
R&D-to-Assets	COMPUSTAT	R&D expense over total assets, set to zero when R&D expense is missing.
Revenue/Employees	COMPUSTAT	Sales revenue ( <i>in 000,000s</i> ) scaled by the number of employees ( <i>in 000s</i> ). $SALE/(EMP*1000)$ .
Intangible Capital /Employees	WRDS	Intangible capital value ( <i>in 000,000s</i> ) scaled by the number of employees ( <i>in 000s</i> ). Intangible capital value is obtained from WRDS (Peters and Taylor, 2017)
InstOwnPct	Thomson Refinitiv	Total number of shares held by institutions divided by the total number of shares outstanding.
SOP VotedForPct	ISS Voting Analytics	Ratio of the number of "for" votes to the total number of votes cast
First HC Adoption (0/1)	ISS Incentive Lab	1 if a firm adopts human capital performance plan for the first time during the sample period in a given year, 0 otherwise
First HS Adoption (0/1)	ISS Incentive Lab	1 if a firm adopts health and safety performance plan for the first time during the sample period in a given year, 0 otherwise

First DEI Adoption (0/1)	ISS Incentive Lab	1 if a firm adopts diversity, equity, and inclusion performance plan for the first time during the sample period in a given year, 0 otherwise
First TC Adoption (0/1)	ISS Incentive Lab	1 if a firm adopts talent and culture performance plan for the first time during the sample period during a given year, 0 otherwise
Multiple HC Metrics (0/1)	ISS Incentive Lab	1 if a firm adopts human capital performance plans that utilize more than one human capital metrics in a given year, 0 otherwise.
Single HC Metric (0/1)	ISS Incentive Lab	1 if a firm adopts human capital performance plans that utilize only one human capital metric in a given year, 0 otherwise.
Multiple HC Metric Types (0/1)	ISS Incentive Lab	1 if a firm adopts human capital performance plans that utilize more than one human capital metric subcategory (HC, TC, or DEI) in a given year, 0 otherwise.
Single HC Metric Type (0/1)	ISS Incentive Lab	1 if a firm adopts human capital plans that utilize only one human capital metric subcategory (HC, TC, or DEI) in a given year, 0 otherwise.
Number of HC Metrics	ISS Incentive Lab	The total number of human capital metrics utilized in a firm's CEO performance plans in a given year.
Number of HS Metrics	ISS Incentive Lab	The total number of health and safety metrics utilized in a firm's CEO performance plans in a given year.
Number of DEI Metrics	ISS Incentive Lab	The total number of diversity, equity, and inclusion metrics utilized in a firm's CEO performance plans in a given year.
Number of TC Metrics	ISS Incentive Lab	The total number of talent and culture metrics utilized in a firm's CEO performance plans in a given year.