ESG Pay Features and Firm Value:
International Evidence from Integrated Reporting

Abstract

This paper examines how various ESG Pay features — presence, time horizon, weighting, completeness, and metric "hardness"—influence firm value. While ESG incentives alone may reflect managerial entrenchment or "window-dressing," adopting an Integrated Reporting (IR) framework can strengthen their credibility and curb agency costs. We hand-collect ESG compensation data for a global sample of IR reporters and a matched group of non-reporters. Our results show that simply including short-term ESG goals does not improve future operating cash flows or Tobin's Q. However, firms that pair the IR framework with long-term, heavily weighted, comprehensive, or quantitatively "hard" ESG metrics are associated with higher firm value. These relations intensify in firms with substantial institutional ownership and deeper ESG integration in their Management Discussion and Analysis. Overall, our findings suggest that an IR framework enhances ESG-Pay's effectiveness by reducing greenwashing and mitigating agency problems.

Keywords: ESG Incentives; Firm Value; Integrated Reporting; Agency; Greenwashing

JEL Classification Codes: G32, G34, M41, M48, Q56, Q58

1. Introduction

Until 2021, over 30% of companies around the world have incorporated Environmental, Social, and Governance (ESG) metrics in executive compensation schemes, and sustainability is more and more a CEO-level issue fundamental to the core business (Cohen et al. 2023; Flammer et al. 2019). Companies may adopt ESG-related pay for efficient contracting purposes, alight interests of long-term investors or stakeholder groups, or signal a commitment to ESG when making future operating and investment decisions (Cohen et al. 2023; Benabou & Tirole 2010). However, ESG-related pay could also be a type of agency cost: an entrenchment strategy at the expense of shareholders (Flammer et al. 2019; Friedman 1970). In addition, firms may also integrate ESG targets in compensation schemes and incentives for impression management and "window-dressing" purposes (Berrone and Gomez-Mejia 2009; Melloni et al. 2017; Cho et al. 2010; Grewal et al. 2021).

If ESG incentives reflect efficient contracting to avoid exposure of future financial risks, such as climate change impact on stranded assets, customer satisfaction, or product quality (Cohen et al. 2023), the related improvement of short-termism would increase long-term firm value (Benabou & Tirole 2010). However, the relationship between ESG incentives and firm value is still unclear, as empirical studies find mixed evidence on the association between ESG pay and financial outcomes (Flammer et al. 2019; Cohen et al. 2023). We revisit this issue in two ways: on the one hand, we investigate the "black box" of ESG incentives by investigating which features of ESG incentives' design (i.e., presence, time-orientation, weight, completeness, or hardness of ESG metrics) are associated with firm value. On the other hand, we study the association of ESG incentives and firm value by explicitly differentiating between companies using an integrated report (IR) and companies not using it. Adopting an integrated reporting framework could signal

improved transparency, thus reducing agency costs and greenwashing concerns associated with ESG-related compensation (Obeng et al. 2021).

For the purposes of our analysis, the IR setting is particularly suitable as the IR Framework explicitly posits a link between corporate disclosure and firm internal management practices, including incentives (Barth et al. 2017; The International Integrated Reporting Framework (IIRC) 2013), thus hinting at the importance of integrating different governance mechanisms. Managers of firms claiming the adoption of the IR framework are required to take a holistic approach to decision making to attain long-term financial stability (Obeng et al. 2021, IIRC 2013). IR, therefore, could be used by the board to escape executives' short-termism and managerial entrenchment and ensure their efforts on sustainable value creation. Therefore, the idea underlying our study is well-suited to the claims of the IR framework (IIRC, 2013)[1].

We expect that the use of an IR[2] will have a reinforcing effect and reduce the agency costs associated with ESG-related compensation design. On the one hand, Obeng et al. (2021) suggest that an increase in reporting transparency through IR that relies less on traditional accounting measures can affect incentives alignment positively, and more specific information about the firm's valuation creation process may allow shareholders to write compensation contracts that depend on a wider range of metrics (Bushman and Smith 2001). This argument is not without

[1] In June 2021, the International Integrated Reporting Council (IIRC) is merged with the Sustainability Accounting Standards Board (SASB) to form the Value Reporting Foundation (VRF) (Cohn, 2021). One year later, the VRF is merged into the International Sustainability Standards Board (ISSB) under the IFRS Foundation and other existing reporting frameworks, such as TCFD, SASB and CDSB. The merging processes reflect the potential global approach being developed (Barth 2023). While the ISSB is developing future international sustainability disclosure standards, the ideas provided by IR framework, such as linkages between governance, strategy, and business models, including inputs and outputs, are embedded, and implemented more comprehensively (IFRS Foundation, 2022).

[2] In brief, IR is a form of corporate reporting that combines financial and ESG disclosure in a single document (i.e., it is an integrated financial and ESG form of disclosure). Maintaining that the purpose of IR is to explain to providers of financial capital how an organization creates value over time by means of various forms of capital (financial, human, intellectual, social, manufactured, natural), the International Integrated Reporting Council (IIRC) expects managers' decision-making processes to improve because of the adoption of IR (The International Integrated Reporting 2013).

tensions since disclosures and adoption of the IR framework are costly and depend on the level of integration (Obeng et al. 2021). On the other hand, an IR also facilitates external monitoring by expanding the information set and communicating financial and ESG information in an integrated and concise way (Obeng et al. 2021). As such, IR may strengthen the credibility of ESG pay and signal managerial commitment to ESG-related variables. ESG incentives become more 'substantive' if firms communicate the engagement of managers to stakeholders and explain through proper disclosure how changes in ESG performance relate to changes in the firm's overall performance and the value creation.

The research design is based on an analysis of ESG incentives' design in CEO compensation packages for IR reporters versus a matched sample of non-reporters[3]. We identify a matched sample of control companies using Bloomberg, based on industry, size, and geographical area (i.e., country). Using a manual content analysis of the IRs recognized by the IIRC, we collect data on CEO incentives, as detailed in compensation packages. In particular, we analyse the presence of ESG targets, their timeframe (short-term vs medium/long-term), and their relative weights in the packages. Furthermore, we collect information on ESG target completeness (the specific financial vs non-financial/ESG capitals that they are associated with) and their hardness (whether a numerical KPI is explicitly attached to the ESG goal).

Our results show that the inclusion of ESG metrics in CEO's compensation schemes is not significantly associated with firm value (future operating cash flows and Tobin's Q). The results are consistent with the frictions associated with ESG-related pay since it may reflect both efficient contractual value and managerial rent extractions (Cohen et al. 2023). In contrast, the presence of

[3] IR reporters are defined as those organizations whose reports refer to the IIRC or the Integrated Reporting Framework or are influenced by the Framework through participation in Integrated Reporting Networks.

ESG-related targets as *long-term* incentives is associated with greater firm value measured as *ex post* realized operating cash flows in the short (one-year ahead) and long (two-year ahead and Tobin's Q) run, but the effect concentrates on IR reporters only and is statistically stronger relative to non-IR reporters.

Next, we exploit the relative weights to capture the heterogeneity of ESG incentives design in executive compensation and to illustrate which additional characteristic of ESG incentives matters. We find that ESG short-term weights are not valuable, whereas ESG long-term weight is associated with higher operating cash flows only among IR reporters and statistically different relative to non-IR reporters. We then assess the relative weight between short-term ESG incentives and long-term ESG incentives. We find that only long-term oriented CEO's ESG incentives (the weight of long-term ESG-related capitals is higher than the short-term one) are positively associated with future firm value.

In addition, we assess the completeness of the number of nonfinancial capitals considered in incentives' design using continuous variables. We find that the more complete ESG targets are, the higher the ex post realized operating cash flows. The impact of complete nonfinancial capital on operating cash flows is stronger for IR framework reporters relative to non-IR reporters. The results suggest that the more complete nonfinancial capital is considered in their CEO's compensation, better alignment of interest between managers and multiple stakeholders, and thus creates stronger trust and loyalty, generating value in the long run. We also find that only the inclusion of hard quantitative targets produces a significant positive effect on operating cash flows, evidencing that turning ESG objectives into measurable and concrete ones makes them more effective. Next, if the IR framework and ESG incentives strengthen the pre-commitment to a firm's standing on multiple stakeholders that are financially material in the long run, we should see that

value creation is more significant for companies with more long-term oriented investors. Consistent with our expectation, we also find that the positive relationship between ESG long-term incentives and firm value is greater for firms with high institutional investor holdings. Finally, we explore the level of integration of ESG factors in Management Discussion and Analysis (MD&A) using the integration score from Refinitiv. We find that among the IR framework reporters, the effects are stronger for firms with higher integration of financial and extra-financial/ESG factors in their Management Discussion and Analysis (MD&A) section in the annual reports.

We acknowledge that examining IR in a voluntary setting also presents challenges in terms of self-selection since firms that expect to derive the most benefits from using IR are more likely to adopt it. We have tried to mitigate endogeneity concerns with our robustness tests; nonetheless, we refrain from inferring causal relationships from the evidence we present. For instance, we conduct a battery of robustness analyses (i.e. an entropy balancing matching and a Heckman two-step model to correct self-selection bias), and we show that the impact on operating cash flows still holds after controlling for ESG performance.

We contribute to the existing literature as follows. First, we add to the compensation literature on the link between ESG-related pay and firm-level financial outcomes, and to the more general discussion on the role and use of non-financial targets in CEO compensation packages (O'Connell and O'Sullivan 2014). Our results show given the complexity of ESG incentives in executive compensation packages, not only does the presence of ESG incentives matter, but also their relative time-orientation, weight, completeness, and hardness, and they need to be carefully considered when writing contracts. Second, we contribute to the nascent literature in the field of sustainable accounting and governance by investigating the joint use of two key sustainable practices, i.e., reporting and incentives (Flammer et al. 2019; Harjoto and Jo 2011).

More generally, we add to the extensive literature on agency and contracting, pointing to the fact that when the preferences of shareholders and/or other stakeholders are *a priori* misaligned with the incentives of corporate managers (Jensen and Meckling 1976), there is a need for both compensation contracts and accounting disclosure to alleviate the problems of moral hazard, such as managerial entrenchment on rent-seeking (Kanodia and Sapra 2016) in order to better exploit investment opportunities (Jayaraman and Wu 2019) and more generally to obtain economic benefits. Third, we shed light on the importance of coherently combining reporting framework and managerial incentives (i.e., ESG targets) to differentiate "label" and "serious" reporters and foster value creation (Daske *et al.* 2013; Barth et al. 2017). We show that both the IR framework adoption and the degree of ESG integration in MD&A would reduce the agency costs and mitigate "window-dressing" problems. To the best of our knowledge, there is also a lack of research on the implementation of both the IR framework and sustainability incentives, despite the calls for contributions to this area by both academics and practitioners (Busco et al. 2013; Nylander 2015; Serafeim 2015).

2. Empirical prediction

One recent governance innovation is the integration of ESG criteria into executive compensation to provide appropriate incentives to managers. As Harjoto and Jo (2011) suggest, there is increasing advocacy of a more inclusive concept of corporate governance that extends to ESG and redirects managers' attention toward stakeholders that contribute to long-term value creation, while the relationship between multiple ESG governance tools and financial performance remains unclear. However, whether or not the adoption of ESG criteria in executive compensation serves as an effective sustainable governance tool—that is, a tool that influences corporate actions and contributes to value creation—is far from obvious.

On the one hand, ESG metrics or performance could be considered as indicators of future risk exposure (such as the climate change impact on physical assets) and are not captured by current financial performance indicators. For efficient contracting purposes, it is beneficial for the firm's long-term value creation by including them in the compensation schemes to avoid managerial short-termism (Cohen et al. 2023).

In contrast, adopting ESG incentives could also destroy shareholder wealth (e.g., Eccles et al. 2014; Friedman 1970; Galaskiewicz 1997; Navarro 1988). In short, the argument is that it pays to be sustainable and sustainability may simply be a type of agency cost: managers extract private rents by incorporating sustainability policies into their strategies, yet with negative financial consequences for the firm (Balotti and Hanks 1999; Brown et al. 2006). As Staw and Epstein (2000) suggest, CEOs may be rewarded for pursuing ESG initiatives and targets regardless of their economic consequences. If managers decide to engage in ESG activities because of reputational considerations, then some of those activities may be undertaken at the expense of the shareholders (Benabou and Tirole 2010; Moser and Martin 2012). As such, this type of target might be used by powerful CEOs to 'camouflage' pay-performance sensitivity (Bebchuk et al. 2002; Bebchuk and Fried 2003, 2004). According to Cespa and Cestone (2007), incumbent managers under a tough replacement threat may also use relationships with stakeholder activists as an entrenchment strategy (Harjoto and Jo 2011). In addition, executives may 'push' to have compensation plans based on measures that cannot be thoroughly assessed and verified, such as sustainability metrics. One notable exception in this debate is the recent paper by Flammer et al. (2019), who document that the adoption of CSR contracting leads to an increase in long-term orientation and firm value. In addition, ESG incentives are often ineffective because the design of CEO compensation schemes integrating non-financial targets might be viewed as a "window-dressing" strategy or

impression management tool (Berrone and Gomez-Mejia 2009), mainly driven by institutional pressures for legitimacy (Westphal and Graebner 2010; Westphal and Zajac 1994, 1998; Westney 1995). Specifically, firms might adopt ESG pay only symbolically to retain the benefits of being perceived as "good" while avoiding costly ESG efforts (Cohen et al. 2023). While the adoption of an incentive plan may signal to managers that the board of directors considers sustainability to be an important issue, it could be merely impression management: the degree of substance of such a plan plays an essential role in whether it really shapes managers' decision-making and ultimately affects value creation (Flammer et al. 2019).

The impression management hypothesis may eventually help to explain why empirical assessments of the association between ESG incentives and firm performance indicate ambiguous results, including positive, negative, U-shaped, or even inverse-U-shaped links (Eccles et al. 2014; Margolis and Walsh 2003; Eccles and Serafeim 2015). The link between ESG incentives and firm performance may be difficult to prove because the use of non-financial targets in CEO compensation schemes may simply signal a desire on the part of firms to use popular, 'modern' management practices as a heuristic for managerial effectiveness without taking into consideration their effects (Connolly et al. 1981; Staw and Epstein 2000).

Overall, the link between ESG incentives and a firm's value creation is a crucial and controversial question that is still only partially addressed. Although a large financial canon argues that companies' ESG engagement contributes to firms' competitiveness and long-term value creation (Flammer 2015; Flammer et al. 2019; Flammer and Kacperczyk 2016; Flammer and Luo 2017), ESG activities and policies often suffer from agency problems (Flammer et al. 2019; Harjoto and Jo 2011). First, managers may invest in ESG activities for the sake of their reputation, as an entrenchment strategy that only benefits themselves and not the shareholders (Benabou and

Tirole 2010; Moser and Martin 2012). Second, given the considerable heterogeneity across stakeholder groups, managers might use ESG activities to give priority to some salient stakeholders, who directly contribute to a firm's bottom line in a formal contractual relationship with the firm, as opposed to stakeholders that might be less salient but financially material to the firm in the long run (Flammer et al. 2019).

We argue that an IR framework helps firms reduce agency costs associated with ESG pay and conflicts of interest among various stakeholders, facilitates internal decision making, and increases the success of engaging in ESG initiatives that can generate positive future cash flow.

First, as firms communicate ESG targets, such disclosure enhances the accountability of managers to stakeholders and the commitment towards long-term value creation. The combined use of the IR framework and incentives strengthens the ESG orientation of managers, decreases the relative acquisition costs of ESG information, and improves managers' success in identifying those ESG initiatives that also generate positive future cash flows. We especially focus on real effects (cash flow) aspects of firm value creation, since they are less subject to manipulation than accounting numbers (Barth et al. 2017). Second, the conflict resolution literature argues that the role of a corporation is also subject to discursive scrutiny by non-investing stakeholders (i.e., social or environmental activists) as well as shareholders (Harjoto and Jo 2011). Effective corporate governance forces managers to act in the best interests of their shareholders. Accounting disclosure, as a relevant governance mechanism, can be used not only to monitor managers' actions but also as direct input to compensation contracts to help align the interests of managers and shareholders and reduce agency costs (Obeng et al. 2021).

An increase in reporting transparency through IR that relies less on traditional accounting measures can affect incentives alignment positively, and more specific information about the

firm's valuation creation process may allow shareholders to write compensation contracts that depend on a wider range of metrics (Bushman and Smith 2001). Since internal monitoring mechanisms, such as compensation contracts, are often viewed as ineffective (Jensen 1993), institutional investors and security analysts provide effective external monitoring (Chung and Jo 1996; Demsetz and Lehn 1985; Shleifer and Vishny 1986; Yu 2008).

IR could provide a series of information that is not available in annual reports. For instance, IR explicitly acknowledges the importance of Integrated Thinking (IT), i.e., of business managers' integrated decision-making and actions that consider the creation of value over the short, medium and long term, and that take into account the economic, social and environmental context within which the organization operates as well as its different capitals (IIRC, 2013). Given the characteristics of the IR framework, CEOs of IR reporters are better able to understand and manage the inherent trade-offs between financial and non-financial/sustainable performance dimensions. In fact, from the perspective of managers, the link between sustainable performance and financial performance is not straightforward (Bansal 2005; Sharma 2000). For instance, pollution reduction strategies are challenging to implement since they require new equipment, cross-functional employee coordination, and production redesign. They also may take time to come to completion (e.g., Aragon-Correa & Sharma). Managers then need performance measurement and management tools that may help them keep track and make sense of all the multifaceted dimensions related to sustainable initiatives, including the link with financial outcomes. An IR may represent such tool. This is also the idea of IT that is put forward by the IR proponents. The IIRC explicitly claims that IR is beneficial not only in terms of improved transparency for external users but also in terms of enhanced internal decision-making processes (Eccles and Serafeim 2015).

In addition, IR does not just provide historical information, but includes future-oriented information as well (Obeng et al. 2021). One of the potential benefits of IR touted by the IIRC is that its use can lead to breaking down functional silos, making better connections between financial and non-financial aspects of firm performance, and focusing managers' attention on long-term instead of simply short-term strategies, leading to better real decisions and enhanced firm value (Barth et al. 2017). According to the IIRC (2020), IR should help redirect managerial attention towards integrating multiple stakeholders and capital management (i.e., integrated thinking) and improving the quality of decisions and, therefore, value creation over time.

As a matter of fact, many IR reporters seek to improve value creation over the short, medium, and long term, tying together management practices based on a broader understanding of the resources they use and manage. Rather than narrowly focusing on financial tools, such organizations base their business decisions on interconnected information across multiple forms of capital, including natural, social, and relationship, human, manufactured, and intellectual. IR could thus reduce the costs of implementing ESG incentives and increase the success of engaging in ESG initiatives that can generate positive future cash flows. This is consistent with IR and ESG incentives to facilitate integrated thinking, whereby managers are motivated to recognize and take into account the interconnections between various types of resources and parts of the firm, enabling them to make better decisions and investment choices. To paint a more nuanced picture of ESG incentives and to better understand the interplay between the design of ESG incentives and the use of IR, we do not limit our analysis to the presence of such incentives, but rather look in detail at their characteristics. In particular, we analyse the weight, completeness, time orientation, and hardness. Further details of these variables are provided in the next section.

4. Research design

4.1. Sample

We start with the population sample of IR reporters recognized by the IIRC[4] and we build a matched sample of IR non-reporters. Peers were identified using Bloomberg Terminal based on three criteria: industry, size, and geographical area (i.e., country). To capture information on CEO incentives, we collected data from 2013 to 2018[5] based on a manual content analysis of the corporate reports available. We collected compensation variables from four types of corporate reports — integrated reports, annual reports, governance reports or proxy statements (for US firms), and sustainability reports— downloaded from firms' websites.[6] We then merged our manually collected data with data from Compustat Global, Datastream, and Thomson Reuter Eikon (now called Refinitiv, previously called ASSET4).

The final sample consists of 425 non-missing firm-year observations across the period 2013–18. Table 1 summarizes our sample compositions, and Panel A shows that our data are generally evenly distributed across the sample period. IR reporters come from 13 countries, with 20% of the firms being from South Africa, where IR has been mandatory since 2010 for listed firms on a comply or explain basis (King III Report, 2009); the rest are voluntary IR reporters.[7]

[4] Available at: http://examples.integratedreporting.org/reporters?start=A&page=1

[5] We start in 2013 when the first IIRC framework was published (IIRC, 2013) and stop at 2018 to mitigate the cofounding effects of the EU Directive on Non-Financial and Diversity Information and the confounding effect of the Covid pandemic.

[6] We started searching in IRs. If nothing was found in IRs, then we moved to other documents. In some cases, compensation information is scattered across multiple reports, so we combined such information. We kept track of the reports where we found compensation information.

[7] In the main analysis, we include country fixed effects to control for voluntary (vs mandatory) adoption of IR. Consistent with prior studies we maintain both groups in the sample to increase the number of observations (Melloni, Caglio, & Perego, 2017). In a robustness test, we also remove all mandatory reporters and obtain similar results.

Table 1, Panel B presents the composition of the sample by industry, where utilities and retail industries have the largest numbers of observations, respectively 13% and 16% of the sample.

< Insert Table 1 >

4.2. Regression model

We examine the relationship between a joint use of IR and CEO ESG incentives and firm value by estimating the following general fixed effects equation:

$$Operating\ Cash\ Flows_{j,t+1} = \alpha + \beta_1 ESG\_Incentive_{j,t} + \Sigma\beta_2 Controls_{j,t} + \Sigma\beta_3 FEs + \varepsilon_{j,t} \quad (1)$$

where $Operating\ Cash\ Flows_{j,t+1}$ is our proxy for value creation as it represents *ex post* realized operating cash flows (j and t denote firm and year). $ESG\_Incentive_{j,t}$ is one of the dimensions (i.e. presence, time-orientation, weight, completeness, and hardness). They are defined more specifically below. We include fixed effects[8] to control firm and industry-level time-invariant characteristics. Since it is a multi-country study, we also control for country fixed effects, and year fixed effects account for the general economic trend.[9] We cluster standard errors by firm since our ESG incentive measures are at the firm level.[10] As we are specifically interested in the interplay between the IR framework and ESG incentives, we also estimate equation (3) for IR reporters and non-IR reporters, respectively.[11] We also include a battery of controls in line with previous

[8] We obtain the same results when we drop firm fixed effects and we drop all the controls.
[9] Our VIF test is below 10.
[10] As we illustrate in the following, we also tried different clustering schemes as robustness checks (e.g., we cluster standard errors at country and industry levels). We obtain qualitatively similar results (untabulated).
[11] We use subsample analyses since IR reporter is an indicator variable and it is more intuitively to observe the average effects of ESG metrics compared with an interaction model, but we do obtain similar results when we use a full interaction specification (untabulated). We also use a continuous variable to measure the level of integration from Refinitiv/ASSET4 in the additional analyses.

contributors. All variable definitions and measurements are provided in the next section and in the Appendix.

4.3. Variables' measurement

Ex post realized operating cash flows

We follow Barth et al. (2017) and construct different measures of the performance effects of the joint use of IR and ESG incentives to capture firm value creation in terms of *ex post* realized operating cash flows (*cfo*). We measure *cfo* as *ex post* one-year ahead net cash flows from operating activities deflated by beginning-of-period total assets. We also measure firm long-term value creation (cfo^{+2}) as two-year ahead *ex post* net cash flows from operating activities, deflated by beginning-of-period total assets. We also use Tobin's Q as an alternative measure of a firm's long-term value (Flammer et al. 2019).

ESG pay features

We capture five aspects of the design of CEO incentives, namely the presence, time orientation, weights, completeness, and the hardness. In line with the IIRC framework, the type of target was classified based on the six forms of capital definition (IIRC Framework, 2013): financial, manufactured, natural, human, intellectual, social, and relationship [12]. According to these categories, we distinguish between ESG targets (based on one of the above capital forms except for financial) and non-ESG targets (based on financial capital).

First, regarding the presence, we construct a variable *presence_st* equal to one if there is at least one ESG target of short-term incentive in the CEO compensation package, and zero otherwise, whereas *presence_lt* is equal to one if at least one long-term ESG incentive is present, zero

[12] Appendix B illustrate in more details the specific pillars that we used to code the targets.

otherwise. Second, *weight_st* captures if short-term ESG incentives' weight is available, and *weight_lt* indicates if long-term ESG incentives' weight is available.

Third, in order to measure the time orientation within the compensation package, we construct a variable *long_termism*, equal to one if the sum weight of non-financial capitals in long term incentives is greater than the sum weight of non-financial capitals in short term incentives or if the weight of at least one long-term ESG target is greater than the weight of short-term target.

Fourth, in terms of completeness, we also measure the "completeness" of target types using continuous variables. Specifically, we compute the variable *complete_lt* as the number of capital forms (excluding financial capital) that are represented in the vector of targets included in the long-term incentive of the CEO's compensation package. Variable *complete_st* counts the number of capital forms (excluding financial capital) that are represented in the vector of targets included in the short-term incentive of the CEO's compensation package. These two variables both take values from 0 to 5. The most common non-financial targets for CEOs are human-type targets (77%), followed by social-type targets (29%), intellectual-type targets (26%), and natural-type targets (20%). IR reporters typically link CEO compensation to human capital, including employees' well-being, equity, safety, engagement and satisfaction, and the company's talent pool management. Social and relationship capital examples include customer relations, stakeholder relations, and, more generally, societal objectives. Intellectual capital examples include product-related aspects such as quality, innovation, and productivity. With regard to natural capital, examples include resources and energy consumption, water, and gas emissions. We plot the relationship between the evolution of ESG incentive design and integrated reporting over our sample period in Figure 1. Panel A represents the number of nonfinancial capitals included in the compensation scheme, either as short-term or long-term. Panel B represents the percentage of firms

in our sample including ESG weights either as short-term or long-term. We observe that on average, over time, there is an increasing trend of having ESG metrics in compensation schemes and IR firms include more non-financial capitals than non-IR firms.

Finally, for hardness, hardness equal to one if there is at least one hard ESG objective linked to the CEO's compensation, zero otherwise. "A 'hard target' is a target with clear-cut underlying quantification, e.g. reduction of CO2 emissions with 20 percent in the next year; increasing the number of women at the top from 10 percent to 25 percent by 2020 or improving the rating of the firm at the DJSI from the fifth position to the fourth position in the next year." (Maas, 2015).

< Insert Figure 1 >

Control variables

Based on prior literature (Barth et al. 2017; Biddle et al. 2009; Cheng et al. 2013; Navissi et al. 2016), we include variables to control for other factors that may be correlated with our dependent variable(s). We include an indicator variable to capture whether a firm issues a standalone CSR report in addition to its IR report, *csr_sa*. Prior literature (Cho et al. 2012; Dhaliwal et al. 2011) suggests that there might be a link between CSR disclosure and firm performance; for example, firms issuing CSR reports have a lower cost of capital. We also include an indicator variable *ceo_change*, equal to one if the firm's CEO has changed during a specific year, and zero otherwise (Karaevli 2007)[13]. Some variables are included to control for financial performance (Barth et al., 2017): *roa* is measures return on asset; *mtb* is the market-to-book ratio of equity; *size* is the natural

[13] We also drop all observations experiencing CEO change during a specific year. Untabulated results show that the results remain the same.

logarithm of total assets; *loss* is an indicator variable equal to one if income before extraordinary items is negative, and zero otherwise. Finally, following Barth et al. (2017) and Biddle et al. (2009), we control for cash *(cash)*, price volatility *(volatility)*, length of the operating cycle (*op_cycle*), ratio of cash flow from operations to sales (*cfo_sales*), ratio of cash to property, plant and equipment (*slack*) and leverage ratios (*lev*), since these have previously been found to be related to capital investment[14]. Appendix A lists all the variables used in our analyses.

5. Results

5.1. Summary statistics and correlation analysis

Table 2 Panel A presents the descriptive statistics for our main variables. 79% of our sample firms (*presence_st* = 79%) include ESG targets in their short-term incentive when designing CEO compensation packages, whereas only 30% of our sample firms include long-term ESG targets. In general, 52% of companies include weight information in short-term ESG incentives, whereas only 17% of companies include weight in long-term ESG incentives. On average, companies design two of the five non-financial capitals within their CEO's compensation packages. Only 10% of the companies put more weight on long-term ESG incentives relative to short-term ones. The inclusion of more weight in short-term ESG incentives is subject to the risk of greenwashing since ESG contracting, by definition, helps direct management's attention to stakeholders that are financially material to the firm in the long run (Flammer et al. 2019). The mean one-year ahead *ex-post* realized operating cash flow scaled by total assets (*cfo*) is 0.10. IR reporters have significantly ($p<0.05$) higher ex-post realized operating cash flows (0.11 vs. 0.09)

[14] We also include board size, independence and duality as additional controls and results do not change.

than non-reporters. There are a number of CEO changes in our sample period (*ceo_change* = 13%). The mean market-to-book ratio (*mtb*) is 3.02 (consistent with Barth et al. 2017; Biddle et al. 2009).

In Table 2, Panel B, we present the Pearson correlation coefficients among our variables of interest (*ex post* operating cash flows, ESG incentives) and control variables. As expected, our ESG incentives variables are correlated among themselves and with the *IR* in line with previous contributions. Firms adopting the IR framework are more likely to include ESG incentives in executive compensation. IR framework reporters have higher operating cash flows than non-IR reporters, whereas the inclusion of ESG incentives is costly to the firm. The completeness of non-financial capital and long-term orientation is positively correlated with operating cash flows.

< Insert Table 2 >

5.2. Regression results

First, we estimate the effect of the presence of ESG incentives on firm value and the heterogeneity between IR reporters versus non-IR reporters. Table 3 Panel A presents the results, we find that ESG schemes in compensation packages are not associated with higher future operating cash flows, especially in the short-term incentives (in the form of income statement-based indicators for yearly performance). This is consistent with the idea that mere inclusion of ESG incentives in CEO compensation schemes has a lot of frictions; it may reflect efficient contracting for future risk exposure, but also suffer greenwashing risk and may simply be a type of agency costs. In contrast, the coefficient of *presence_lt* is positively significant (coefficient=0.047, $p< 0.01$) among IR reporters and is statistically stronger than non-IR reporters ($p<0.01$). In terms of economic magnitude, a standard deviation increase in ESG-related incentives is associated with a 9% increase in *ex post* operating cash flows. In all models presented

in Table 3 Panel A, we include all control variables, industry fixed effects and year fixed effects, firm fixed effects and country fixed effects, and standard errors are corrected for heteroskedasticity and are clustered by firm. We also analyse the variance inflation factors (VIF) to assess multicollinearity[15]. Consistent with prior literature, the maximum VIF for the model constructed is 7.01 and is thus below the general threshold of 10 (Bedford & Malmi, 2015). To further mitigate the issue, we report the sensitivity estimates by dropping the controls and/or the fixed effects in Table 3, Panel B.

To address potential self-selection into ESG-linked pay, I use both an entropy-balancing matching and a Heckman two-step approach. Because firms voluntarily including ESG targets in CEO compensation may differ on unobserved dimensions that also affect decision outcomes, I instrument ESG incentives with the 2010 mandate requiring listed South African firms to adopt an Integrated Reporting (IR) framework. This regulatory change is exogenous to any individual firm's strategy, yet significantly increases the likelihood of embedding ESG criteria in executive pay (relevance). At the same time, IR mandates do not directly alter firm performance and show no correlation with future operating cash flows, satisfying the validity condition.

Methodologically, I first estimate a probit predicting ESG incentive adoption using *non_mandatory_IR* status, then compute the inverse-Mills ratio (IMR). I then re-estimate Equation (1) by OLS, including IMR to correct for selection bias (Harakeh et al. 2019; Poretti et al. 2023). In parallel, I apply entropy balancing to create a matched sample that equalizes pre-treatment covariates across firms with and without ESG pay. Panel C of Table 3 reports that our core results persist under both the matched-sample regression and the Heckman-corrected model.

[15] We obtain similar results when we separate *presence_lt* and *presence_st* in two regression models.

These robustness checks confirm that simply adding ESG incentives to CEO compensation does not, by itself, enhance value creation—it represents a costly investment with no guaranteed payoff. In contrast, coupling ESG targets with the credibility conferred by a mandated IR framework reduces managerial entrenchment, promotes integrated thinking across stakeholder and capital management, and ultimately raises future operating cash flows. Thus, IR adoption amplifies the effectiveness of ESG incentives by improving internal decision-making and mitigating both agency costs and greenwashing concerns.

< Insert Table 3>

Cumulative ESG weighting is the key driver to understand the real cost behind the adoption of ESG-linked incentives (Derchi, 2015). Indeed, Guay (2014) even suggests that, as of today, "it is not sure if sustainability makes the top 10 items a board of directors uses to determine a company and an executive's performance" because, according to his estimates, "most of times, sustainability may account for a portion of executives' compensation as small as 1% of the overall amount" (The Guardian, 2014). We assess the impact of the relative weights of ESG incentives in CEO's compensation packages on firm value. We measure *weight_st* as equal to one if there is the weight of at least one short-term ESG target in the CEO compensation package, zero otherwise. *weight_lt* is equal to one if at least one long-term ESG target's weight is indicated in the CEO compensation package, zero otherwise. Table 4 displays the results. Consistent with previous findings, ESG weight in compensation packages is not associated with higher future operating cash flows, especially in the short-term incentives. In contrast, the coefficient of *weight_lt* is positively significant (coefficient=0.026, $p<0.05$) among IR framework reporters and is statistically stronger than non-IR reporters ($p<0.01$). ESG targets are negatively associated (not significantly) with cash flows, possibly suggesting that the focus on ESG objectives *per se* might be detrimental to a firm's

financial performance, especially if the focus is on achieving short-term ESG targets. Overall, our evidence suggests that only IR reporters employing the weight of ESG incentives for their CEOs are able to improve their internal decision-making processes.

< Insert Table 4>

Apart from the indicator measures above, we also construct two continuous variables to measure the completeness (i.e., the number of different capital forms included in the vector of targets for the CEO) of the ESG incentives. *complete_st* is the number of nonfinancial (manufactured, natural, human, intellectual, social and relationship) capitals included in the short-term incentive of compensation scheme (values from 0 to 5). *complete_lt* counts the number of nonfinancial (manufactured, natural, human, intellectual, social and relationship) capitals included in the compensation scheme, excluding financial capital (values from 0 to 5). We expect the more complete nonfinancial capitals considered in their CEO's compensation, better alignment of interest between managers and multiple stakeholders, and it thus creates stronger trust and loyalty. Results in Table 5 show the coefficient of *complete_lt* is positively significant (coefficient=0.009, $p<0.05$) for the full sample and for the IR reporters (coefficient=0.015, $p<0.01$), whereas *complete_st* is not. The impact of complete nonfinancial capitals on operating cash flows is stronger for IR framework reporters relative to non-IR reporters. The joint use of the IR framework and diverse ESG targets improves the ability of a company to generate operating cash flows. For IR reporters, the more diverse that ESG targets are, the higher the ex post realized operating cash flows. Consistent with our main findings, the economic benefits for IR reporters depend not only on the presence of ESG targets but also on their completeness in representing the multifaceted capital forms used by firms to generate value, especially in the long run.

< Insert Table 5>

Next, we measure the long-termism by comparing the relative weight assigned to long-term ESG incentives with the weight assigned to short-term ESG incentives. Variable *long_termism* is equal to one if the sum of weights of non-financial capitals in long-term incentives is greater than the sum of weights of non-financial capitals in short-term incentives, or if the weight of at least one long-term ESG target is greater than the weight of short-term targets. Firms claiming as IR framework reporters should place lower weightings on metrics fostering short-termism. This view is notably supported by Deckop (2006), who, based on 313 observations from the 2001 S&P 500, highlights that the greater the short-term orientation of the metrics included in executive pay, the lower the ESG performance. Bettis, Bizjak, Coles, & Kalpathy (2015) find that firms linking executive pay to EPS/profit-based targets are likelier to cut discretionary expenses recklessly (especially R&D), which in turn sacrifices shareholder value. Results in Table 6 show that *long_termism* is positively associated with firm value (coefficient=0.018, $p<0.05$) for the IR reporters. The findings are consistent with the idea that when the relative weight of long-term ESG incentives is higher than that of short-term incentives, integrated thinking embedded within the IR framework redirects managers' standing with stakeholders who are financially material in the long run and improves their ability to identify initiatives with higher positive net present values.

< Insert Table 6>

Next, we consider the hardness of ESG incentives. According to McGuire (2003) and Maas (2015), the inclusion of corporate social responsibility (CSR) targets in executive pay schemes does not lead to an improvement in ESG performance. Only the inclusion of hard quantitative targets produces a significant positive effect on ESG performance (Maas, 2015). Specifically, we define *hardness* as equal to one if there is at least one hard ESG objective (quantitative measure) linked to the CEO's compensation, zero otherwise. Results in Table 7 show that the coefficient of

hardness is positively significant (coefficient=0.036, p<0.10) for the IR reporters (coefficient=0.015, p<0.01), and the impact of ESG incentives' hardness on operating cash flows is stronger for IR framework reporters relative to non-IR reporters (p<0.01). This brings evidence that turning ESG objectives into measurable and concrete ones makes them more effective.

< Insert Table 7>

5.3 Additional analyses

First, we employ other measures to capture firm value creation. We replace our dependent variables with *tobinq* and cfo^{+2}, two-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets. which captures the long-term firm value creation. Table 8 presents our additional results. Consistent with our main findings, the positively significant coefficients of *presence_st* and *presence_lt* indicate that the joint use of IR and ESG incentives has positive long-term value implications.

< Insert Table 8>

Second, based on agency theory and the conflict resolution hypothesis, the adoption of both ESG disclosure and ESG incentives leads to positive performance effects through reduced agency costs and reduced conflicts of interest among various stakeholders. If this is true, we should expect the positive effects of their joint adoption to be stronger for firms with larger percentage ownership by long-term investors. Michaely et al. (2014) show as an important measure of governance that the degree of institutional concentration signals monitoring power that is independent of management (Beasley 1996). Dedicated, long-term investors can play a more effective monitoring role in ESG issues, given the fact that short-termism is a major barrier to a transition to sustainability (Serafeim 2015).

We define *high institutional ownership* as equal to one if a firm-year observation is assigned to the "high institutional ownership" group if the percentage of institutional investors is higher than the Fama-French 48 industry-year median, and to the "low institutional ownership" group otherwise. Results in Table 9 illustrate that the positive association between the joint adoption of the IR framework and ESG incentives and future operating cash flows is significantly greater for firms with higher institutional holdings. These findings are consistent with the notion that the degree of institutional holdings plays a facilitator role in external monitoring and minimizing the agency costs in short-termism.

< Insert Table 9>

Finally, we examine the degree of integrating financial and non-financial/ESG factors in firms' management discussion and analysis (MD&A) section. Barth et al. (2017) identify a real effect channel through which IR improves internal decision making and thus is associated with economic benefits and improved firm performance. We expect that a higher level of integration would not only enhance the monitoring by investors and allow them to better detect and constrain managers' rent extraction, but also facilitate the "integrated thinking" learning processes. We define *high integration* as equal to one if a firm-year observation is assigned to the "high integration score" group if the score of measuring integrated strategy in MD&A is higher than the median, and to the "low integration score" group otherwise. Results in Table 10 suggest that the positive association between the joint adoption of the IR framework and ESG incentives and future operating cash flows is significantly greater for firms with a higher level of integration.

6. Conclusion

Companies' inclusion of ESG metrics in executive compensation schemes may reflect managerial entrenchment as a type of agency costs and conflicts of interest between heterogeneous investors and stakeholder groups (Serafeim 2015). Typically, transient/ short-term investors differ greatly in their appreciation of ESG activities and investment strategies from more dedicated/ long-term ones (Bushee and Noe 2000; Serafeim 2015). Firms may also use nominal ESG pay as a "window-dressing" strategy and avoid costly ESG effort (Cohen et al. 2023; Berrone and Gomez-Mejia 2009; Michelon et al. 2015; Cho et al. 2010).

In this paper, we explore the value creation effects of the specific characteristics of ESG incentives' design (i.e., ESG pay features), focusing on the IR context. In this respect, IR offers a proper and unique institutional setting as it is explicitly focused not only on improving transparency for external users (i.e., information function), but also on enhancing internal decision-making processes (i.e., transformation function). IR framework allows us to capture not only the presence of ESG incentives but also the weight given to these multiple stakeholders, since the relative weight given to different performance indicators represents the actual importance attached to ESG-linked goals. We argue and show that the mere inclusion of ESG incentives in executive compensation is not necessarily valuable, especially for the short-term ones. Adopting the IR framework and ESG incentives (in terms of the presence, weight, completeness, time orientation, and hardness) has a positive effect on a firm's value creation in light of reduced agency costs and conflicts of interest among various stakeholders. As advocated by previous research, we offer empirical support for the economic benefits of combining these two elements: our results consistently show that an association between IR and CEO ESG incentives improves long-term value creation.

In this respect, we support the arguments of prior literature pointing to the risk of agency problems, both managerial opportunism and heterogeneous investors' conflicts of interest, especially with regard to companies' ESG engagement. At the same time, we contribute to the debate on the link between ESG incentives and firm financial performance showing that, to effectively support firm value creation, managers need integrated sustainability governance, combining reporting and performance measurement tools, that helps them monitor and understand all the multifaceted dimensions related to sustainable initiatives, including their link to financial outcomes, and IR may represent such a tool.

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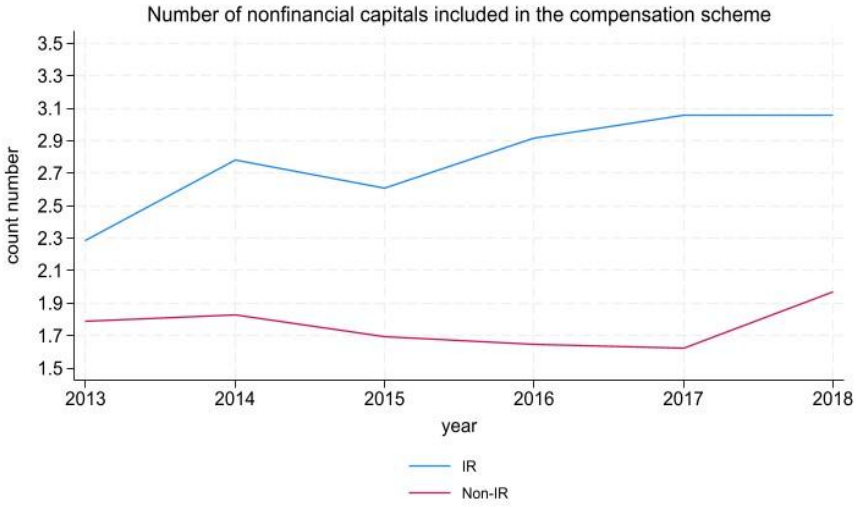
Figure 1 – ESG incentives design and Integrated Reporting

This figure shows the relationship between the evolution of ESG incentive design and integrated reporting over our sample period. Panel A represents the number of nonfinancial capitals included in the compensation scheme either as short-term or long-term. Panel B represents the percentage of firms in our sample including ESG weights in their CEO's compensation scheme, either as short-term or long-term, in a given sample year (right axis). The blue line represents firms adopting integrated reporting frameworks as a signaling mechanism and the red line represents firms without the adoption of integrated reporting frameworks.



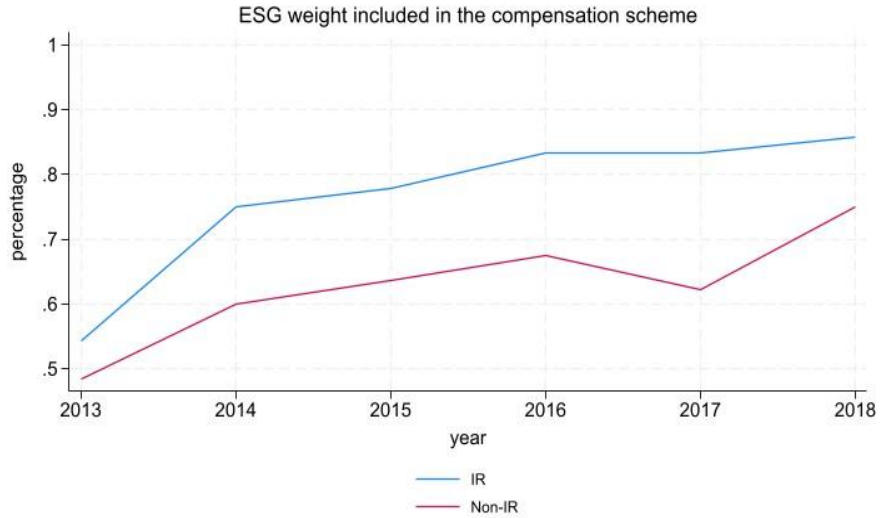


Table 1. Sample

Panel A: Year Composition		
Year	Firm	Percent
2013	68	16
2014	71	16.71
2015	69	16.24
2016	73	17.18
2017	73	17.18
2018	71	16.71
Total	425	100

Panel B: Industry Composition		
Fama French 48 Industry	N	Percent
Retail	70	16.47
Utilities	54	12.71
Communication	36	8.47
Non-Metallic and Industrial Metal Mining	29	6.82
Precious Metals	22	5.18
Petroleum and Natural Gas	21	4.94
Chemicals	20	4.71
Business Services	19	4.47
Construction	19	4.47
Food	16	3.76
Beer & Liquor	12	2.82
Coal	12	2.82
Pharmaceutical Products	12	2.82
Tobacco Products	12	2.82
Wholesale	12	2.82
Construction Materials	9	2.12
Healthcare	9	2.12
Other	9	2.12
Electrical Equipment	6	1.41
Medical Equipment	6	1.41
Steel Works Etc	6	1.41
Computers	5	1.18
Business Supplies	3	0.71
Personal Services	3	0.71
Transportation	3	0.71
Total	425	100

Table 2. Descriptive Statistics and correlations

Table 2 Panel A reports summary statistics of key variables for the full sample from 2013 to 2018. All continuous variables are winsorized to the 1st and 99th percentiles of their distributions. *IR* reporter is an indicator equal to one if it is an integrated reporting framework reporter (as reported in the International Integrated Reporting Council (IIRC) website), zero otherwise. *presence_st, and presence_lt* equal one if there is at least one short-term Environmental, Social and Governance (ESG) target in the CEO compensation package and at least one long-term ESG target, respectively, zero otherwise. *weight_st* is equal to one if there is the weight of at least one short-term ESG target in the CEO compensation package, zero otherwise. *weight_lt* is equal to one if there is the weight of at least one long-term ESG target in the CEO compensation package, zero otherwise. *complete_st* is the number of nonfinancial (manufactured, natural, human, intellectual, and social and relationship) capitals included in the short term incentive of compensation scheme (values from 0 to 5). *complete_lt* counts the number of nonfinancial (manufactured, natural, human, intellectual, and social and relationship) capitals included in the compensation scheme, excluding financial capital (values from 0 to 5). *Long_termism* is equal to one if the sum weight of non-financial capitals in long term incentives is greater than the sum weight of non-financial capitals in short term incentives or if the weight of at least one long-term ESG target is greater than the weight of short-term target. *Hardness* is equal to one if there is at least one hard ESG objective linked to CEO's compensation, zero otherwise. *cfo* is one-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets, respectively. Panel B presents Pearson correlations, with the correlation coefficients with a significance level of 0.05 or higher in bold. See Appendix 1 for control variable definitions.

Panel A	N	Mean	Std. Dev.	Q1	Median	Q3
IR reporter	425	0.504	0.501	0.000	1.000	1.000
presence_st	425	0.791	0.407	1.000	1.000	1.000
presence_lt	425	0.301	0.459	0.000	0.000	1.000
weight_st	425	0.522	0.500	0.000	1.000	1.000
weight_lt	425	0.176	0.382	0.000	0.000	0.000
complete_st	425	1.649	1.315	1.000	1.000	3.000
complete_lt	425	0.626	1.098	0.000	0.000	1.000
long_termism	425	0.096	0.296	0.000	0.000	0.000
hardness	425	0.214	0.411	0.000	0.000	0.000
cfo	425	0.101	0.086	0.052	0.080	0.125
op_cycle	425	4.730	0.627	4.276	4.667	5.106
volatility	425	0.824	0.757	0.203	0.429	1.349
size	425	13.592	3.642	10.139	15.049	16.931
mtb	425	3.017	3.713	1.150	1.920	3.260
cfo_sale	425	0.175	0.149	0.062	0.139	0.256
slack	425	0.580	1.132	0.078	0.179	0.511
cash	425	0.078	0.067	0.029	0.062	0.108
lev	425	0.593	0.678	0.157	0.364	0.634
csr_sa	425	0.967	0.179	1.000	1.000	1.000
loss	425	0.122	0.328	0.000	0.000	0.000
roa	425	0.067	0.094	0.031	0.051	0.092
ceo_change	425	0.129	0.336	0.000	0.000	0.000

Panel B	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) cfo	1.000									
(2) IR reporter	**0.152**	1.000								
(3) presence_st	-0.044	**0.414**	1.000							
(4) presence_lt	-0.021	**0.159**	**0.262**	1.000						
(5) weight_st	**-0.259**	0.068	**0.422**	-0.060	1.000					
(6) weight_lt	-0.050	**0.089**	**0.147**	**0.557**	**0.233**	1.000				
(7) complete_lt	**0.116**	**0.138**	**0.193**	**0.794**	**-0.099**	**0.467**	1.000			
(8) complete_st	0.000	**0.276**	**0.589**	**0.214**	**0.154**	0.039	**0.224**	1.000		
(9) long_termism	0.049	0.038	0.051	**0.411**	0.057	**0.706**	**0.446**	-0.016	1.000	
(10) hardness	-0.071	-0.021	**0.255**	**0.095**	**0.304**	**0.104**	**0.183**	**0.139**	0.063	1.000

Table 3. Integrated Reporting and ESG Incentives' Presence

Table 3 reports results from OLS regressions of ex post operating cash flows on the indicator having ESG targets present in their CEO's compensation package. The sample spans the 2013-2018 period. Column one shows the full sample, whereas column 2 and column 3 display the IR reporter and the non-IR reporter, respectively. Panel B is a sensitivity test by dropping firm fixed effects/controls. Panel C reports results using an entropy balancing matching approach and a Heckman two-stage correction model. *IMR* is the inverse Mills ratio calculated in the first stage. The dependent variable, *cfo* is one-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets. See the Appendix for variable definitions. Firm, year, industry, and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A – Baseline

	cfo^{+1}		
	Full	*IR reporter*	*Non-IR reporter*
presence_st	-0.001	0.001	-0.004
	(-0.05)	(0.05)	(-0.28)
presence_lt	0.015	0.047***	-0.009
	(1.49)	(3.25)	(-0.66)
op_cycle	-0.000	0.068**	-0.008
	(-0.05)	(2.19)	(-0.94)
volatility	0.006	-0.004	0.009
	(0.87)	(-0.30)	(1.11)
logasset	0.000	-0.009**	0.002
	(0.20)	(-2.43)	(1.09)
mtb	0.005***	0.007***	0.005***
	(5.20)	(3.08)	(4.03)
cfo_sale	-0.052	-0.155**	0.052
	(-1.01)	(-2.52)	(0.57)
slack	0.000	-0.003	0.007
	(0.08)	(-0.28)	(1.19)
cash	-0.060	-0.122	-0.030
	(-0.71)	(-0.65)	(-0.29)
lev	-0.003	-0.008	-0.002
	(-0.33)	(-1.29)	(-0.12)
csr_sa	-0.008	-0.012	-0.009
	(-0.89)	(-1.01)	(-0.79)
loss	-0.012	-0.035***	-0.002
	(-1.37)	(-3.39)	(-0.14)
roa	0.034	0.056	0.043
	(0.48)	(0.70)	(0.47)
ceo_change	-0.000	-0.003	0.001
	(-0.01)	(-0.31)	(0.20)
Constant	0.097**	-0.071	0.073
	(2.20)	(-0.45)	(1.30)
Observations	425	214	211
Adjusted R-squared	0.707	0.743	0.572
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *presence_lt*		*0.055***	

Panel B – Sensitivity tests

	(1)	(2)	(3)	(4)	(5)	(6)
		cfo^{+1}			cfo^{+1}	
	Full	*IR reporter*	*Non-IR reporter*	*Full*	*IR reporter*	*Non-IR reporter*
presence_st	0.015	0.033	-0.028	0.016	0.019	-0.013
	(0.53)	(0.95)	(-0.98)	(1.41)	(0.74)	(-0.79)
presence_lt	-0.010	0.031***	-0.020	0.002	0.029***	-0.017
	(-0.75)	(3.04)	(-1.21)	(0.21)	(3.18)	(-1.59)
op_cycle				0.000	0.053**	-0.011
				(0.03)	(2.35)	(-1.60)
volatility				0.023**	-0.021	0.025***
				(2.40)	(-1.43)	(3.50)
logasset				-0.000	-0.005*	-0.000
				(-0.31)	(-1.94)	(-0.08)
mtb				0.005***	0.011***	0.005***
				(4.59)	(3.72)	(4.04)
cfo_sale				0.048	-0.073	0.114**
				(1.59)	(-1.37)	(2.06)
slack				-0.007**	-0.012***	-0.000
				(-2.35)	(-3.50)	(-0.07)
cash				0.181**	0.280***	0.123
				(2.48)	(2.73)	(1.24)
lev				-0.001	-0.013	0.002
				(-0.23)	(-1.67)	(0.21)
csr_sa				-0.021**	-0.015	-0.012
				(-2.11)	(-1.27)	(-1.37)
loss				0.004	-0.014	0.008
				(0.31)	(-1.08)	(0.60)
roa				0.392***	0.171	0.205**
				(4.38)	(1.38)	(2.68)
ceo_change				-0.008	-0.012	-0.004
				(-1.08)	(-1.05)	(-0.53)
Constant	0.092***	0.071**	0.110***	0.035	-0.112	0.090**
	(3.65)	(2.18)	(5.84)	(1.02)	(-0.91)	(2.04)
Observations	425	214	211	425	214	211
Adjusted R-squared	0.455	0.703	0.522	0.641	0.756	0.608
Fixed Effects		Yes			Yes	
Cluster at Firm		Yes			Yes	
Diff. in Coefficients on *presence_lt*		*0.051***			*0.046***	

Panel C- Controlling for self-selection bias

	Entropy balancing		*Heckman two-step*	
	IR reporter	*Non-IR reporter*	*IR reporter*	*Non-IR reporter*
presence_st	0.001	0.006	0.004	-0.002
	(0.05)	(0.40)	(0.15)	(-0.13)
presence_lt	0.047***	-0.011	0.051***	-0.008
	(3.25)	(-0.79)	(3.54)	(-0.59)
IMR_st			0.055	0.010
			(0.64)	(0.09)
IMR_lt			-0.529	-0.468
			(-1.31)	(-0.97)
Observations	214	211	214	211
Adjusted R-squared	0.753	0.637	0.751	0.564
Fixed Effects	Yes	Yes	Yes	Yes
Cluster at Firm	Yes	Yes	Yes	Yes
Diff. in Coefficients on *presence_lt*	*0.057***		*0.059***	

Table 4. Integrated Reporting and ESG Incentives' Weights

Table 4 reports results from OLS regressions of ex post operating cash flows on the indicator having *the weight* of ESG targets present in their CEO's compensation package. The sample spans the 2013-2018 period. Column one shows the full sample, whereas column 2 and column 3 display IR reporter and non-IR reporter, respectively. The dependent variable, *cfo* is one-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets. See the Appendix for variable definitions. Firm, year, industry, and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
		cfo^{+1}	
	Full	*IR reporter*	*Non-IR reporter*
weight_st	0.000	-0.004	0.014
	(0.03)	(-0.36)	(1.17)
weight_lt	0.009	0.026**	-0.001
	(1.09)	(2.40)	(-0.07)
Observations	425	214	211
Adjusted R-squared	0.707	0.745	0.572
Controls		Yes	
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *weight_lt*		0.027***	

Table 5. Integrated Reporting and ESG Incentives' Completeness

Table 5 reports results from OLS regressions of ex post operating cash flows on the *completeness* of ESG targets present in their CEO's compensation package. The sample spans the 2013-2018 period. Column one shows the full sample, whereas column 2 and column 3 display IR reporter and non-IR reporter, respectively. The dependent variable, *cfo* is one-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets. *complete_st* and *complete_lt* are two continuous variables *complete_st* is the number of nonfinancial (manufactured, natural, human, intellectual, and social and relationship) capitals included in the short term incentive of compensation scheme (values from 0 to 5). *complete_lt* counts the number of nonfinancial (manufactured, natural, human, intellectual, and social and relationship) capitals included in the compensation scheme, excluding financial capital (values from 0 to 5). See the Appendix for variable definitions. Firm, year, industry and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
		cfo^{+1}	
	Full	*IR reporter*	*Non-IR reporter*
complete_st	0.001	-0.004	0.005
	(0.24)	(-0.56)	(0.75)
complete_lt	0.009**	0.015***	0.006
	(2.64)	(3.15)	(0.95)
Observations	425	214	211
Adjusted R-squared	0.711	0.752	0.572
Controls		Yes	
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *complete_lt*		0.009***	

Table 6. Integrated Reporting and ESG Incentives' Time Orientation

Table 6 reports results from OLS regressions of ex post operating cash flows on the indicator having *the long term orientation* of ESG targets in their CEO's compensation package. The sample spans the 2013-2018 period. Column one shows the full sample, whereas column 2 and column3 display IR reporter and non-IR reporter, respectively. The dependent variable, *cfo* is one-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets. *long_termism* is equal to one if the sum weight of non-financial capitals in long term incentives is greater than the sum weight of non-financial capitals in short term incentives or if the weight of at least one long-term ESG target is greater than the weight of short-term target. See the Appendix for variable definitions. Firm, year, industry and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
		cfo^{+1}	
	Full	*IR reporter*	*Non-IR reporter*
long_termism	0.008	0.018**	0.002
	(0.92)	(2.47)	(0.10)
Observations	425	214	211
Adjusted R-squared	0.707	0.744	0.572
Controls		Yes	
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *long_termism*		0.016	

Table 7. Integrated Reporting and ESG Incentives' Hardness

Table 7 reports results from OLS regressions of ex post operating cash flows on the indicator of *the hardness* (if there is quantitative objective) of ESG targets in their CEO's compensation package. The sample spans the 2013-2018 period. Column one shows the full sample, whereas column 2 and column 3 display IR reporter and non-IR reporter, respectively. See the Appendix for variable definitions. Firm, year, industry, and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
		cfo^{+1}	
	Full	*IR reporter*	*Non-IR reporter*
hardness	0.014	0.036*	0.002
	(1.51)	(1.91)	(0.15)
Observations	425	214	211
Adjusted R-squared	0.708	0.746	0.572
Controls		Yes	
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *hardness*		0.034***	

Table 8. Alternative Measures of Firm Value

Table 8 reports results from OLS regressions of Tobin's Q and long-term operating cash flows on different characteristics of ESG incentives' design. The sample spans the 2013-2018 period. See the Appendix for variable definitions. Firm, year, industry, and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	tobin's Q				cfo^{+2}			
	IR reporter	*Non-IR reporter*	*IR reporter*	*Non-IR reporter*	*IR reporter*	*Non-IR reporter*	*IR reporter*	*Non-IR reporter*
presence_st	0.048	0.306			0.030	-0.020		
	(0.31)	(1.39)			(1.25)	(-1.01)		
presence_lt	0.523***	-0.009			0.066***	-0.017		
	(2.73)	(-0.04)			(2.91)	(-0.65)		
weight_st			0.135	0.239			-0.038	-0.011
			(1.22)	(1.24)			(-1.61)	(-0.57)
weight_lt			0.330**	0.108			0.050**	0.005
			(2.22)	(0.42)			(2.07)	(0.22)
Observations	214	211	214	211	214	211	214	211
Adjusted R-squared	0.944	0.746	0.942	0.746	0.444	0.117	0.445	0.115
Controls				Yes				
Fixed Effects				Yes				
Cluster at Firm				Yes				
Diff. in Coefficients on presence_lt/weight_lt	0.532***		0.222*		0.083***		0.045**	

Table 9. Integrated Reporting, ESG Incentives, and Institutional Ownership

Table 9 reports results from OLS regressions of ex post operating cash flows on the indicator of ESG incentives, conditional on firms' institutional ownership. The sample spans the 2013-2018 period. *high institutional ownership* is equal to one if a firm-year observation is assigned to the "high institutional ownership" group if the percentage of institutional investors is higher than the Fama-French 48 industry-year median, and to the "low institutional ownership" group otherwise. See the Appendix for variable definitions. Firm, year, industry, and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)		(2)
		cfo^{+1}	
	IR reporter		*Non-IR reporter*
presence_lt	0.033**		-0.005
	(2.60)		(-0.38)
high institutional ownership	-0.003		-0.012
	(-0.26)		(-0.72)
presence_lt × high institutional ownership	0.032*		-0.013
	(1.92)		(-0.79)
Observations	209		184
Adjusted R-squared	0.743		0.570
Controls		Yes	
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *presence_lt × high institutional ownership*		0.044**	

Table 10. Level of Integration of ESG in MD&A

Table 10 reports results from OLS regressions of ex post operating cash flows on the indicator of ESG incentives, conditional on firms' institutional ownership. The sample spans the 2013-2018 period. *high integration* is equal to one if a firm-year observation is assigned to the "high integration score" group if the score of measuring integrated strategy in MD&A is higher than the median and to the "low integration score" group otherwise. Integrated Strategy in MD&A Score is defined as "Does the company explicitly integrate financial and extra-financial factors in its management discussion and analysis (MD&A) section in the annual report? – integration of the extra financial information within the company's business review section – US-based companies, 10-K under the management discussions and analysis section – UK-based companies, Strategic Report within the annual report containing extra-financial data. Firm, year, industry, and country fixed effects are included. All continuous variables are winsorized to the 1st and 99th percentiles. Standard errors are corrected for heteroskedasticity and are clustered by firm (robust t statistics are in parentheses). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)		(2)
		cfo^{+1}	
		IR reporter	
	High Integration		*Low Integration*
weight_st	-0.018		0.011
	(-1.07)		(0.58)
weight_lt	0.055**		0.023
	(2.78)		(0.95)
Observations	110		104
Adjusted R-squared	0.805		0.598
Controls		Yes	
Fixed Effects		Yes	
Cluster at Firm		Yes	
Diff. in Coefficients on *weight_lt*		0.032*	

Appendix A -Variable Definitions	
IR reporter	equal to one if it is an integrated reporting framework reporter (as reported in the International Integrated Reporting Council (IIRC) website), zero otherwise. Non-IR reporters are identified with a 1:1 matching based on size, industry, and geographical area.
presence_st	equal to one if there is at least one short-term ESG target in the CEO compensation package, zero otherwise.
presence_lt	equal to one if there is at least one long-term ESG target in the CEO compensation package, zero otherwise.
weight_st	equal to one if there is the weight of at least one short-term ESG target in the CEO compensation package, zero otherwise.
weight_lt	equal to one if there is the weight of at least one long-term ESG target in the CEO compensation package, zero otherwise.
complete_st	the number of nonfinancial (manufactured, natural, human, intellectual, social, and relationship) capitals included in the short-term incentive of the compensation scheme. Values from 0 to 5.
complete_lt	the number of nonfinancial (manufactured, natural, human, intellectual, social, and relationship) capitals included in the compensation scheme, excluding financial capital. Values from 0 to 5.
long_termism	equal to one if the sum weight of non-financial capitals in long-term incentives is greater than the sum weight of non-financial capitals in short-term incentives, or if the weight of at least one long-term ESG target is greater than the weight of short-term targets.
hardness	equal to one if there is at least one hard ESG objective linked to the CEO's compensation, zero otherwise. "A 'hard target' is a target with clear-cut underlying quantification, e.g. reduction of CO2 emissions with 20 percent in the next year; increasing the number of women at the top from 10 percent to 25 percent by 2020 or improving the rating of the firm at the DJSI from the fifth position to the fourth position in the next year." (Maas, 2015)
Dependent Variables	
cfo^{+1}	one-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets.
cfo^{+2}	two-year ahead ex post net cash flows from operating activities deflated by beginning-of-period total assets.
tobin's Q	market value of total assets / Book value of total assets
Control Variables	
op_cycle	Natural logarithm of the sum of receivables to sales and inventory to cost of goods sold multiplied by 360.
volatility	price volatility scaled by the natural logarithm of total assets.
size	natural logarithm of total assets.
mtb	market-to-book ratio of equity calculated as the number of common shares outstanding multiplied by end-of-year share price, divided by the book value of common shareholders' equity.
cfo_sales	ratio of cash flow from operations to sales.
slack	ratio of cash to property, plant and equipment.
cash	cash and cash equivalents scaled by total assets.
lev	leverage is calculated as the ratio of total debt to the sum of total debt and the book value of common shareholders' equity.
csr_sa	an indicator variable that equals one if a firm issued a stand-alone CSR report, and zero otherwise.
loss	an indicator variable that equals one if income before extraordinary items is negative, and zero otherwise.
roa	return on asset
ceo_change	indicator variables that equal one if the CEO has changed during a specific year, and zero otherwise.

Appendix B – Coding examples for non-financial capitals under the IR framework	
Natural	Resource/Energy consumption
	Environment
	Waste/Gas emissions
	Environmental accidents
Intellectual	Strategy/Vision
	Procedure/Process
	Licence
	Reputation/Brand
	Corporate governance
	Value/Culture
	Innovation/Technology/R&D
	Ethics/Integrity/Audit rating
	Risk
	Quality
	System/Business drivers
	New product design
Manufactured	M&A/Geographic expansion/Growth
	Plant/Infrastructure
	Operation/Production
	Land
Human	Health and Safety
	CEO individual performance/experience/
	KPIs/management
	Transformation/
	Employment equity
	Talent management/
	attraction/retention
	Succession
	Employee/People/HRM
	Leadership/Team
	Organisational development
Social and relational	Collaboration among business
	Customer
	Relationships with principals/stakeholders
	CSR/Society/Community