

# Corporate social responsibility and insider horizon

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**Abstract:** We show a positive relation between insider horizon and a firm's corporate social responsibility (CSR) performance. This positive relation is likely driven by good internal governance rather than agency problems. To support a causal interpretation, we adopt managerial career horizon reductions and the rejection of inevitable disclosure doctrine as exogenous shocks to insider horizon. We find that the observed positive effects are stronger when firms have higher ownership of long-term and socially responsible institutional investors, when insiders sign long-term compensation contracts, and when firms face less takeover pressure. We document the real effects of long-horizon insiders using various raw CSR metrics. Overall, our results indicate that insiders' long-term orientation can promote CSR.

*Key words:* CSR; insider investment horizon; short-termism; corporate governance

*JEL classification:* G14, G23, G32, M14

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## 1. Introduction

Many academics and practitioners believe corporate social responsibility (CSR) activities are more likely to create long-term value than near-term profits<sup>1</sup> because of substantial up-front investments (e.g., Martin and Moser, 2016) and the underreactions of investors (e.g., Edmans, 2011; Duan, Li, and Wen, 2023). In his recent annual letters to the CEOs of Blackrock’s portfolio firms, Larry Fink, Chairman and CEO of Blackrock, emphasized the positive effects of CSR on firm value over the long run and encouraged the firms to make long-term strategies to improve CSR<sup>2</sup>. Edmans (2020) argues that CSR and shareholder value align in the long term (i.e., the “pie-growing mentality”), and thus a long-term perspective is required when stakeholders commit to CSR.

In this paper, we study whether and how the horizon of insiders primarily including top managers and directors influences firm-level CSR performance. That is, does the longer horizon of insiders lead to better CSR performance? We focus on insider horizon for three reasons. First, insiders can directly affect corporate strategies and steer the direction of firms compared to institutional investors and other shareholders, who usually express their views through voting and trading. Second, CSR may depend on insiders’ desire to engage in prosocial activities rather than other stakeholders’ demands or willingness to pursue social value (Benabou and Tirole, 2010). In this case, insiders’ preferences play an important role in CSR activities. Third, insiders tend to cut long-term investments when they can personally profit from boosting short-term performance.<sup>3</sup> Because the effects of CSR may not be realized immediately, myopic insiders may reduce CSR investments and activities when pressured by short-term targets.

We construct an insider horizon measure based on an insider’s trading behavior with own-company stocks, aiming to capture the insider’s intrinsic desire to pursue long-term value. Edmans, Gosling, and Jenter (2023) find that insiders’ intrinsic motivations may have a greater impact on decision making than incentive pay, though the intrinsic motivations can be influenced by financial incentives. Compared to the conventional insider horizon measures based on insider incentive pay

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<sup>1</sup> Long-term value created by CSR may stem from mitigated risk, especially downside risk (e.g., Albuquerque, Yrjo, and Zhang, 2019; Hoepner et al., 2019), higher employee satisfaction and productivity (e.g., Edmans, 2011; Flammer, 2015), better customer attraction (e.g., Baron, 2008), or reduced labor costs and higher talent retention (e.g., Krueger, Metzger, and Wu, 2024).

<sup>2</sup> See, for example, <https://www.blackrock.com/corporate/investor-relations/2016-larry-fink-ceo-letter>; <https://www.blackrock.com/corporate/investor-relations/2019-larry-fink-ceo-letter>.

<sup>3</sup> See, for example, Edmans, Fang, and Lewellen, 2017; Kraft, Vashishtha, and Venkatachalam, 2018; Ladika and Sautner, 2020.

(e.g., Gopalan et al., 2014), ours appears better able to capture insiders' intrinsic willingness to pursue long-term value, as insiders can decide their own trades within legal guidelines while their compensation contracts are typically approved by a committee.

We adopt the insider investment horizon used by Akbas, Jiang, and Koch (2020) as our proxy for insider horizon. Intuitively, an insider's persistent trading behavior of either buying or selling suggests a lower probability of realizing profits using private information frequently and thus a longer investment horizon. Conversely, if insiders often switch between selling and buying, they are more likely to realize profits in a timely manner, suggesting a shorter investment horizon.<sup>4</sup> Accordingly, we postulate that insiders who exhibit persistent trading behaviors are more likely to enhance CSR because the longer investment horizon reflects a willingness to remain with their firms and pursue long-term value. Indeed, we find this prediction to be borne out in the data.

The positive relation between insider investment horizon and CSR performance is consistent with theories on managerial short-termism, suggesting attitudes toward CSR could differ between long-term and short-term insiders. Narayanan (1985) argues that insiders are likely to boost short-term performance at the expense of long-term value when they possess private information that informs their decisions. Applied in our context, an insider tends to have a longer investment horizon, as reflected by a persistent trading behavior, when they rarely take advantage of private information. Thus, insiders with a longer investment horizon are less likely to sacrifice long-term value for short-term gain, thereby engaging in CSR activities and promoting CSR performance.

We investigate whether long-horizon buyers and sellers make identical impacts on CSR. Intuitively, both long-term buyers and sellers may have similarly positive impacts on CSR as they exhibit less tendency to engage in opportunistic trading to realize profits<sup>5</sup>, though their persistent trading behavior may stem from various factors. For example, long-horizon buyers may trade because of the need to increase corporate control, while long-horizon sellers persistently sell to satisfy liquidity or diversification needs. Consistent with the conjecture, we do not find any difference between long-horizon buyers and sellers' effects on CSR, suggesting that insiders with persistent buying and selling behavior should be treated identically. Therefore, they make similarly

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<sup>4</sup> Akbas, Jiang, and Koch (2020) document that insiders with shorter investment horizons engage more in myopic activities such as earnings management.

<sup>5</sup> Akbas, Jiang, and Koch (2020) show that trades executed by both long-horizon buyers and sellers contain less information content, suggesting that these traders do not engage in opportunistic trading.

positive impacts on CSR.

We then disentangle whether the positive effects of insider investment horizon on CSR performance stem from agency problems of insiders to entrench themselves or from good internal corporate governance, the latter of which can benefit shareholders. To this end, we first distinguish CSR scores into strengths (i.e., positive indicators) and concerns (i.e., negative indicators) and demonstrate that the positive effects of long-horizon insiders on CSR are driven primarily by CSR concerns, to which shareholders are more responsive compared to CSR strengths (Krueger, 2015). Second, having separately assessed financially material and immaterial CSR issues, we show that the positive relation between insider investment horizon and CSR is attributed mainly to financially material CSR issues, which can generate positive financial returns for shareholders (Khan, Serafeim, and Yoon, 2016). These evidence supports the view that good internal corporate governance motivates insiders to engage in CSR, which can potentially benefit shareholders.

We consider all types of insiders in the baseline analysis and find a positive relation between insider investment horizon and CSR in general. However, due to different personal attributes and insiders' power, different insiders' influence on CSR may vary. Thus, we explore how insider investment horizon affects CSR, considering different types of insiders. First, we find that both top directors' and managers' investment horizon exhibit positive effects on CSR. Second, when examining the CEO, chairman of the board, and CFO individually, we discern that the CEO's investment horizon exerts the most pronounced effects on CSR.

Despite various precautions, we may be unable to identify a documented positive relation between insider investment horizon and CSR performance as a causal link. To support a causal interpretation, we adopt two types of potential shocks to insider investment horizon. First, we focus on reductions in managerial career horizons driven by exogenous events, such as CEOs or their close relatives being diagnosed with serious diseases, as Aktas, Boone, Croci, and Signori (2021) demonstrated. The rationale is that when CEOs experience such events, which can reduce their career horizons, they are likely to become myopic and, thus, reduce long-term investments, such as CSR. If a causal link exists between insider investment horizon and CSR, the positive relation between insider investment horizon and CSR would be attenuated after the events reduced managerial horizon. Having adopted a difference-in-difference-in-difference approach, we find that CSR performance deteriorates in response to events that reduce managerial career horizon, which

can lend support for a causal interpretation of our main findings. Second, we facilitate the causal interpretation by relying on the staggered rejection of the inevitable disclosure doctrine that prohibits employees with trade secrets from working for rival firms. In the case of such rejection, insiders may have more outside opportunities and fewer career concerns (Li, Shevlin, and Zhang, 2022). Thus, they may focus more on long-term value and tend to have a longer investment horizon, which may boost the positive relation between insider investment horizon and CSR. Indeed, we find this to be the case in the data, relying on a difference-in-difference-in-difference approach.

Next, we examine the cross-sectional heterogeneity of our main results from different perspectives to better understand the mechanisms through which insider investment horizon can influence CSR performance. First, we test a variation of our results using two characteristics of institutional investors that may affect insiders' long-term perspectives. We show that the positive effects of insider investment horizon on CSR performance are stronger when one firm's long-term and socially responsible institutional (SRI) ownership is higher. Second, we explore whether insiders' compensation contracts alter our main results, as they may affect insiders' desire to pursue long-term value. We find that the sensitivity of insiders' wealth to stock volatility (Vega) and pay duration can enhance the positive effects of insider investment horizon on CSR performance. Third, we show a stronger relation between insider investment horizon and CSR performance under less takeover pressure, as takeover pressure may constrain insiders to pursue long-term value according to Stein (1998). Taken together, these findings corroborate the argument that insider investment horizon can capture insiders' desire to pursue long-term value, thereby influencing CSR performance.

Finally, we conduct a series of tests to add evidence of the real effects of our findings. First, we focus on the level of toxic releases and explore whether firms with long-horizon insiders report a lower level of toxic releases. We find that insider investment horizon is associated with a lower level of toxic releases. Second, we examine the relation between insider investment horizon and CSR compliance violations, documenting that firms with long-horizon insiders are less likely to commit CSR violations and receive fewer CSR violation penalties. Third, we test whether insider investment horizon positively affects employee satisfaction, as long-term insiders can promote overall CSR performance by improving employee satisfaction. We find that firms with long-horizon insiders are more likely to be listed in "100 Best Companies to Work for in America,"

which indicates higher employee satisfaction. Finally, we find that firms with long-horizon insiders tend to have a lower level of risk exposure to ESG issues and fewer ESG incidents, as captured by RepRisk database. Collectively, the above results complement our main findings by focusing on raw CSR metrics. These findings shed light on how long-horizon insiders can promote overall CSR performance by testing the real effects of insider investment horizon.

This study makes three contributions to the literature. First, our study contributes to the burgeoning research investigating CSR determinants, particularly factors related to horizon issues. Prior studies have investigated whether horizon influences CSR performance, paying particular attention to institutional investors' horizons, and have demonstrated that longer institutional investor horizons lead to better firm-level CSR performance (e.g., Kim et al., 2019; Glossner, 2019; Krueger, Sautner, and Starks, 2020; Starks, Venkat, and Zhu, 2023). However, relatively little is known about whether and how other key stakeholders' horizons affect CSR. Our paper fills this gap by establishing a positive link between insider investment horizon and CSR, thereby reinforcing the argument that a long-term perspective is beneficial to CSR. By comparing existing literature using compensation contracts' characteristics (e.g., Flammer and Bansal, 2017; Fu, Shen, Tang, and Yan, 2021) to measure insider horizon, we adopt a stand-alone and intrinsic measure of insiders' willingness to pursue long-term value based on their trading behavior, rather than incentives. Thus, our paper complements this strand of literature by establishing a link between insiders' intrinsic desire for long-term value and CSR.

Second, our study contributes to a large literature investigating the conflicts about corporate policies between short-horizon and long-horizon insiders, namely the consequences of managerial short-termism. Theories on managerial short-termism suggest a negative relation between insider horizon and CSR performance. Prior empirical studies indicate that managerial short-termism results in various detrimental short-term actions that harm firms' long-term value.<sup>6</sup> Notably, Edmans, Fang, and Huang (2022) find long-term negative returns following strategic repurchases, mergers, or acquisitions driven by managerial short-termism. Our study extends this strand of literature by building a link between insider investment horizon and CSR performance. Our

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<sup>6</sup> For example, managerial myopia leads to more earnings management (e.g., Brochet, Loumioti and Serafeim, 2015; Ernstberger et al., 2017), reduced long-term capital and R&D investments (e.g., Edmans et al., 2017; Ladika and Sautner, 2020), more strategic information disclosure (e.g., Edmans et al. 2018) and lower long-term productivity (e.g., Almeida et al., 2019).

empirical evidence supports the view that managerial short-termism tends to harm long-term value.

Third, our paper extends the study of Akbas, Jiang, and Koch (2020) and adds to the scarce literature that focuses on CSR and insider trading. We investigate the effects of insider investment horizon on one important corporate strategy (i.e., CSR), building on Akbas et al. (2020), who primarily examine whether insider investment horizon affects the information content of insider trades.<sup>7</sup> Furthermore, our study fills the void in the literature focusing on CSR and insider trading. Gao, Lisic, and Zhang (2014) conclude that insider trades in firms with better CSR performance exhibit less profitability and generate less information content, which indicates that CSR can alleviate managers' egotism by building a positive culture of altruism and increasing the costs of informed insider trading. In comparison, our paper sheds new light on whether the persistency of insider trading influences CSR. To our knowledge, we are among the first to explore the relation between CSR and insider trading behaviors.

The remainder of this paper proceeds as follows. Section 2 introduces the data and describes the summary statistics. The main empirical results are presented in Section 3, while identification strategies are discussed in Section 4. Section 5 shows the cross-sectional analyses, and Section 6 reveals the real effects of insider investment horizon. Section 7 concludes.

## **2. Data, variables, and sample description**

In this section, we show the data source of our key variables as well as a battery of control variables and how we construct them. We also present the summary statistics of our sample.

### **2.1. Data and variables**

Our firm-level CSR performance measures are from the KLD database, which has a longest history of available ESG rating data since 1991<sup>8</sup> and has been the most frequently used by prior studies measuring firm-level CSR performance<sup>9</sup>. The KLD database processes and evaluates ESG-related information from different sources (e.g., company disclosures and government databases) each year and generates a set of positive (i.e., ESG strengths) and negative (i.e., ESG concerns) indicators

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<sup>7</sup> The authors provide abundant evidence to show the trades of short-horizon insiders are more unexpected and informed about future stock returns compared to long-horizon investors.

<sup>8</sup> Starting in 1991, the KLD ESG dataset covers S&P 500 firms before 2001. In 2001 and 2003, the KLD database began to extend its coverage to firms included in the Russell 1000 and Russell 3000, respectively.

<sup>9</sup> See for example, Hong, Kubik and Scheinkman (2012), Deng, Kang and Lou (2013), Di Giuli and Kostovetsky (2014), Khan, Serafeim and Yoon (2016), Chen, Dong, Lin (2020), Berg, Kolbel and Rigobon (2022).



within eight categories: environment, community, employee relations, diversity, product, human right, corporate governance, and controversial business involvement (i.e., whether a firm’s main operations is related to “sin” sectors such as alcohol and tobacco). A firm is given one (zero) for each indicator when it satisfies (fails to satisfy) the evaluation criteria for the corresponding indicator. In our study, we only consider KLD rating scores for five dimensions: environment, community, employee relation, diversity, and product. The reasons we exclude the human right category are that it is only applicable to a small number of firms and the variation of human right rating is negligible across firms (Chen, Dong, and Lin, 2020). We also exclude corporate governance, because insider investment horizon is related to corporate governance.<sup>10</sup> Finally, we remove the controversial business involvement rating, as firms can do little to change their primary business operations.

Following Deng, Kang, and Low (2013), we calculate the strength (concern) score as strengths (concerns) divided by maximum number of strengths (concerns) for each category in a given year, in order to mitigate the concern of inconsistent total number of ESG indicators across years. Next, we take the difference between strength score and concern score as the index for each category and aggregate the indexes for all five categories to produce our ultimate measure of CSR performance. The measure ranges from -5 to +5.

We extract insider trades data from the Thomson Reuters insider filings database. Corporate insiders, including officers, directors, and beneficial owners who hold more than 10% of a firm’s stock, are required to report their open market trades to the Securities and Exchange Commission (SEC).<sup>11</sup> We only consider open market trades of common shares and exclude small trades of less than 100 shares (see Akbas et al., 2020). We then calculate net shares bought or sold by each insider in a given year and match these with the yearly CSR performance measure. For each insider, we construct the insider investment horizon based on their previous ten-year trading pattern for each year  $t$  as follows:

$$HOR_{i,j,t} = \left| \frac{\sum_{T-9}^T IOF_{i,j,y}}{N} \right|$$

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<sup>10</sup> Akbas, Jiang and Koch (2020) show that short-term insiders tend to work for those firms with weaker corporate governance.

<sup>11</sup> In the beginning, insiders were required to report their trades to the SEC no later than ten days after the end of each trading month, after which the deadline was reduced to two days.

Where  $IOF_{i,j,y}$ , the annual net order flow of insider  $i$  at firm  $j$  in year  $y$ , is calculated as  $\frac{P_{i,j,y} - S_{i,j,y}}{P_{i,j,y} + S_{i,j,y}}$ .

$P$  ( $S$ ) is the total number of shares that an insider purchases (sells) during a given year.  $N$  is the number of years an insider traded from year  $t-9$  to year  $t$ . The ultimate measure of insider investment horizon ( $HOR$ ) ranges from zero to one, indicating that insiders with long (short) investment horizon tend to have an  $HOR$  close to one (zero).<sup>12</sup>

We also construct a series of firm-level and insider-level control variables using the financial data from Compustat, stock price data from CRSP, institutional holding data from the Thomson Reuters Institutional Holdings (13F) database (formerly known as CDA/Spectrum), and insider characteristic data from BoardEx. We define firm size ( $Size$ ) as the natural logarithm of total assets for each fiscal year.  $Cash\ ratio$  is cash and short-term investments deflated by total assets.  $Capex\ ratio$  is the ratio of capital expenditures over total assets.  $Tangibility$  is defined as net property, plants, and equipment deflated by total assets. We measure  $Tobin's\ Q$  as the ratio of market value over total assets.  $Leverage$  is measured as the sum of long-term and current debt deflated by total assets.  $ROA$  is the operating income before depreciation scaled by total assets.  $R\&D\ intensity$  is calculated as annual research and development (R&D) expenses divided by total assets while  $A\&D\ intensity$  is defined as annual advertising expenses scaled by total assets.  $Blue$  is equal to one if the headquarter of a firm locates in a state supporting the Democratic Party during the previous US presidential election (i.e., blue state) and zero otherwise.  $Prior-year\ return$  is the stock return over the past year.  $IO$  is defined as the percentage of outstanding shares held by institutional shareholders. Insider-level control variables include an insider's age ( $Age$ ), their tenure in the firm ( $Tenure$ ), and their gender ( $Gender$ ). We provide details about how to construct all variables used in this study in Appendix A.

## 2.2. Sample description

Our final sample consists of 30,545 observations of 9,449 insiders in 2,095 unique firms from 1996 to 2015.<sup>13</sup> The summary statistics of all variables used for primary results are reported in Table 1.

<sup>12</sup> Unlike Akbas et al. (2020), we do not multiply the ultimate measure by -1, which makes the HOR range lie between -1 to 0, because we expect a positive regression coefficient between insider investment horizon and CSR performance to facilitate the interpretation of our results.

<sup>13</sup> We begin our sample in 1996 because insider data become available in 1986, and we calculate the insider investment horizon based on the past ten-year trading behavior of each insider.

Panel A reports the statistics of firm-level variables. The average CSR score is -0.06, indicating that concerns (0.30) exceed strengths (0.24). Comparing firms in our sample with the whole universe of Compustat firms, we find the average CSR performance of our sample firms is better than that of Compustat firms (*CSR* mean value is -0.11), implying that firms with insider trades do better in CSR. Furthermore, our sample firms are bigger, less leveraged, more profitable, and held by more institutional investors compared to Compustat firms.

[Insert Table 1 here]

Panel B shows the summary statistics of insider-level variables. The mean and median values of *HOR* are 0.82 and 1.00, respectively, suggesting over half of insider-years in our sample have only bought or sold over the past ten years.<sup>14</sup> The negative trading strength (*STR*) reveals insiders sell more than purchase.<sup>15</sup> Meanwhile, the majority of insider-years are officer-years and director-years, which comprise over 85% of the sample. CEO-years, Chairman of board-years, and CFO-years account for 16%, 9%, and 8% of our sample, respectively.

### 3. Main results

In this section, we test whether insider investment horizon affects firm-level CSR performance and discuss the primary empirical results. Section 3.1 introduces the baseline model and presents the baseline empirical results. To shed light on the reasons why insiders are motivated to affect CSR performance, we outline the results of tests created in Section 3.2. In Section 3.3, we explore whether the investment horizon of different insiders affects CSR performance. Finally, we conduct a set of robustness tests by using alternative measures of insider investment horizon and CSR performance in Section 3.4.

#### 3.1. Baseline results

To examine the relation between CSR performance and insider investment horizon, we establish the baseline regression model as follows:

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<sup>14</sup> Our sample shows 62% of insiders have engaged in persistent trading behavior over the past ten years. Following Akbas et al. (2020), we also generate a dummy equal to one if the *HOR* is one to define long-horizon insiders. Replacing *HOR* with the dummy, we find that our main results hold, as shown in next section.

<sup>15</sup> These results are comparable to Akbas et al.'s (2020) summary statistics. Their average monthly *HOR* is 0.79 and the standard deviation is 0.30. Meanwhile, they also find the measure of trading strength is negative, suggesting that insiders sell more often than they purchase.

$$CSR_{j,t+1} = \beta_0 + \beta_1 HOR_{i,j,t} + \gamma_1 X_{j,t} + \gamma_2 Y_{i,j,t} + \delta Industry_k + \theta Year_t + \varepsilon_{i,j,t}, \quad (1)$$

Where  $i$  indexes insiders,  $j$  indexes firms, and  $t$  indexes years. The dependent variable,  $CSR_{j,t+1}$ , is the CSR rating score for firm  $j$  in year  $t+1$ , while the primary independent variable,  $HOR_{i,j,t}$ , is the investment horizon for insider  $i$  in firm  $j$  in year  $t$ . The firm-level control variables described in Section 2.1 are represented by  $X_{j,t}$  and  $Y_{i,j,t}$  includes a set of insider-level control variables such as age, tenure, and gender of each insider. To control for time-invariant industrial characteristics and the variation of CSR performance across years, we include industry-fixed effects ( $\delta Industry_k$ )<sup>16</sup> and year-fixed effects ( $\theta Year_t$ ) in the baseline regression model.<sup>17</sup> To treat insiders heterogeneously and capture their unique individual attributes (e.g., Hiller, Korczak and Korczak, 2015), we introduce insider-level investment horizon in the baseline model. Meanwhile, we analyze the horizon's effects on firm-level CSR performance by considering single primary insiders such as the CEO and chairman of the board (see Section 3.3). In the robustness tests, we also aggregate investment horizon into a firm-level indicator and repeat our baseline analysis, which do not alter our primary findings (see Table IA3 of the Internet Appendix).

We first estimate the baseline model without fixed effects. As presented in Column (1) of Table 2, the coefficient of  $HOR$ , 0.071, with a  $t$ -statistic of 5.59, is positive and significant at the 1% level after controlling for firm-level variables. In Column (3), we add three insider-level controls and find that the coefficient of  $HOR$  remains positive and significant at the 1% level ( $t$ -statistic of 4.30). These results suggest a positive relation between insider investment horizon and firm-level CSR performance. We then control for industry and year fixed effects to examine whether insider investment horizon remains a key determinant of CSR performance. In Column (2), we only include firm-level controls and find that the coefficient of  $HOR$ , 0.038, with a  $t$ -statistic of 3.16, is

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<sup>16</sup> We use the two-digit Standard Industrial Classification (SIC2) code to define industries. Our main results are robust to the three-digit Standard Industrial Classification (SIC3) code and Fama-French 48-industry classification for industries.

<sup>17</sup> We incorporate year and industry fixed effects following prior studies (e.g., Deng, Kang and Low, 2013; Di Giuli and Kostovetsky, 2014; Chen, Dong, and Lin, 2020). We do not incorporate firm or insider fixed effects for two reasons. First, firm and insider fixed effects could absorb the variation of interest pertaining to our research question, which focuses on cross-sectional variations at the firm and insider levels. Second, most of the variation on CSR ratings stems from between-firm variation, given the time-series stickiness of these ratings, and therefore firm and insider fixed effects may absorb much of the variation in CSR ratings.

positive and significant at the 1% level. Ultimately, we include all firm- and insider-level controls, as well as fixed effects in the baseline model, and the results are presented in Column (4). The coefficient of *HOR*, 0.026, with a *t*-statistic of 2.19, is positive and significant at the 5% level, indicating that adding controls and fixed effects does not qualitatively affect our results.

[Insert Table 2 here]

Moreover, the coefficients of other control variables echo the findings of prior literature exploring the determinants of CSR. Specifically, the significantly positive coefficients of *Size* and *ROA* indicate bigger and more profitable firms perform better in CSR, which implies the view “Doing good by doing well” (e.g., Hong, Kubik, and Schinkman, 2012). The positive association between cash ratio and CSR, as well as the negative association between leverage and CSR, is in line with the findings of Xu and Kim (2022), which demonstrate that financial constraints negatively affect CSR. Consistent with the study emphasizing the importance of customer awareness on CSR (Servaes and Tamayo, 2013), the loading on *A&D intensity* is positive. The positive coefficient of *Blue* indicates that firms headquartered in states that support the Democratic Party have better CSR performance, echoing findings showing CSR is related to political affiliation (e.g., Di Giuli and Kostovetsky, 2014). In line with existing evidence that female managers are more likely to engage in CSR activities than other managers (Borghesi et al., 2014), the loading on *Gender* is negative.

There may be several alternative explanations for the positive relation between CSR performance and insider horizon. First, the positive relation can be explained by the deep link between insiders’ human capital, personal wealth, and their firms. Therefore, these long-horizon insiders tend to reduce long-term risk by investing in CSR. To rule out this explanation, we control for delta and insiders’ related wealth and find that our baseline results remain qualitatively unchanged in an unreported analysis. Another potential explanation could be the firms’ investment opportunity set. More explicitly, growth firms with more investment opportunities may focus more on long-term value and make relatively long-term compensation contracts for their executives (e.g., Smith and Watts, 1992). Thus, these firms may have more long-horizon insiders who are more willing to engage in CSR activities. To ensure the positive effects of insider horizon on CSR are not absorbed by the investment opportunity set, we construct various proxies for investment

opportunities such as market-to-book equity ratio, earnings-to-price ratio, and stock return volatility and include them in the baseline analysis. We do not find altered results after adding these controls in an unreported analysis.

We distinguish between persistent buyers and sellers to investigate whether they impact CSR differently. Intuitively, both long-term sellers and buyers can be viewed as long-horizon insiders; they both aim to pursue long-term value, refraining from opportunistic trading, albeit for different reasons (Akbas, Jiang and Koch, 2020). While long-term sellers might frequently sell due to liquidity or diversification needs, long-term buyers might trade with an intention to enhance corporate control. Consequently, both groups are likely to have comparably positive effects on CSR.

[Insert Table 3 here]

To distinguish between long-term buyers and sellers, and to explore whether the positive relation between insider investment horizon and CSR varies between these two groups, we add three variables and their interaction terms with insider investment horizon (*HOR*) and repeat our baseline analysis. The results are presented in Table 3. In Column (1), we construct the variable *STR\_RK* as the rank of the ratio between one insider's net purchase and her firm's total trading volume in each year. It measures one insider's trading strength; thus, a higher value of *STR\_RK* indicates more purchases for one insider. If long-horizon buyers are really more willing to engage in CSR, then the interaction term ( $HOR \times STR\_RK$ ) needs to be positive and significant. However, the coefficient on the interaction term is not significant, albeit with a positive sign, suggesting that long-term buyers do not exert stronger positive effects on CSR than sellers. More directly, we construct the *Netbuyer* and *Netbuyer10* to proxy for buyers in a similar vein. *Netbuyer* is defined as a dummy taking the value of one when net purchase of one insider is positive (i.e., the amount of insider purchases is more than sales) in a given year. *Netbuyer10* has a similar definition, but the net purchase is aggregated over the past 10 years.

According to Columns (2) and (3), the coefficients on the interaction terms between buyer proxy and insider investment horizon remain insignificant, indicating no difference between long-horizon buyers and sellers' impacts on CSR. Collectively, these results corroborate the view that both long-term buyers and sellers exert equivalent positive effects on CSR, as they all pursue long-term investment goals, which is consistent with Akbas, Jiang, and Koch's (2020) argument. In

unreported analysis, we calculate the algebraic value of insider investment horizon (*HOR*) and repeat our baseline analysis by replacing the insider investment horizon with its algebraic value. Under these conditions, long-term sellers have an *HOR* nearing -1, while buyers approach an *HOR* of 1. We do not find a significant coefficient for the algebraic value of *HOR*, indicating that long-horizon buyers and sellers do not have differing effects on CSR.

Overall, our baseline results suggest that an insider investment horizon exerts positive effects on firm-level CSR performance, which is consistent with the view that CSR requires long-term commitment. When distinguishing between long-term buyers and sellers, we do not find our main results to be stronger with respect to a certain type of long-term insider, supporting the view that both long-horizon buyers and sellers focus on long-term investment goals and, thus, should be treated equally.

### 3.2. Good internal corporate governance or agency problems?

There might be two distinct explanations for the positive relation between insider investment horizon and CSR performance, given the debate on whether CSR can create shareholder value. On the one hand, CSR can be regarded as an intangible asset that drives long-term value (e.g., Edmans, 2023). Thus, long-horizon insiders promote CSR performance to pursue long-term value, indicating the alignment between insiders' interests and shareholder value. In other words, the positive effects of insider investment horizon on CSR performance can be interpreted as good internal corporate governance. On the other hand, CSR might be detrimental to shareholder value since insiders may improve CSR performance for selfish purposes, such as building a socially friendly image to entrench their positions, at the expense of shareholder value. In this case, there is a conflict between insiders' interests and shareholder value, reflecting the agency problems between insiders and shareholders (e.g., Krueger, 2015; Masulis and Reza, 2015; Cheng, Hong, and Shue, 2023). In our context, agency problems refer to insiders' propaganda detailing their efforts to engage in CSR activities and promote CSR performance but not benefiting shareholders ultimately. Put differently, the positive relation between insider investment horizon and CSR performance can be interpreted as agency problems. To discriminate between good internal corporate governance and agency problems, we conduct the following tests.

3.2.1. Strengths and concerns. We examine the effects of insider investment horizon on CSR strengths and concerns separately. As CSR performance equals CSR strengths minus CSR concerns, the baseline results can be driven by either a positive relation with CSR strengths and/or a negative relation with CSR concerns. Krueger (2015) documents that investor responses to negative CSR events are strong, while investors respond weakly to positive CSR events. Thus, if long-horizon insiders really care about shareholder value, they may aim to reduce the downside of CSR, which investors concentrate on relative to CSR's strengths. In this case, the positive relation between CSR performance and insider investment horizon may be attributed to a lower level of CSR concerns. Conversely, if the goal of long-horizon insiders is to entrench themselves by building a socially friendly image without creating value for shareholders, they may engage more in promoting CSR strengths. In this case, the positive relation may stem from a higher level of CSR strengths.

[Insert Table 4 here]

To explore, we repeat the exercise but replace the dependent variables in the baseline model with CSR strengths and concerns. Panel A of Table 4 tabulates the results. Column (1) indicates there is no significant relation between insider investment horizon and CSR strengths, as the *t*-statistic of loading on *HOR* is 0.16. In comparison, Column (2) shows the loading on *HOR* is -0.025, with a *t*-statistic of -2.92, revealing a negative relation between insider investment horizon and CSR concerns. Thus, we demonstrate that the positive relation between insider investment horizon and CSR performance primarily arises from a lower level of CSR concerns rather than a higher level of CSR strengths. These evidence supports the view that the positive effects of insider investment horizon on CSR reflect good internal corporate governance rather than agency problems, since long-horizon insiders focus on reducing the downside of CSR that shareholders care about.

3.2.2. Material and immaterial issues. We conduct a more straightforward analysis to determine whether long-horizon insiders benefit shareholders by engaging in CSR activities. More specifically, we investigate whether the insider investment horizon is related to financially material CSR performance and immaterial CSR performance. From the perspective of shareholders who pursue the maximization of financial return, financially material CSR issues are much more important than immaterial ones. Khan, Serafeim and Yoon (2016) document that better



performance on financially material CSR issues can significantly predict higher future stock returns, but this is not the case for immaterial CSR issues. If better CSR performance driven by long-horizon insiders aligns with the interests of shareholders, we would find a positive relation between insider investment horizon and financially material CSR issues.

Because there is a wide variation of material CSR issues across industries, we refer to the Sustainability Accounting Standards Board (SASB) Materiality Map to discriminate between material and immaterial CSR categories for different industries.<sup>18</sup> Founded in 2011, the SASB aims to establish a connection between CSR issues and their financial impact and create standards for companies to disclose financially material CSR information for 11 sectors that consist of 77 industries.<sup>19</sup> One typical example is that greenhouse gas (GHC) emissions matter to the extractive and mineral processing sector, but not the consumer goods sector. Data security, a social issue, is material for the technology and communications sector but immaterial for the food and beverage sector. To determine whether a CSR indicator is material or immaterial for firms within different industries, we hand-map firm-level CSR indicators from the KLD database with the SASB sector-specific guidelines.<sup>20</sup> We then calculate the material strengths (concerns) for each CSR subcategory as the aggregate material strengths (concerns) under the subcategory scaled by the maximum number of indicators within the subcategory. The material (immaterial) CSR rating score is constructed by subtracting material (immaterial) concerns from material (immaterial) strengths.

After constructing material and immaterial CSR scores, we repeat the baseline model, replacing the dependent variable with the financially material and immaterial CSR score. Panel B of Table 4 presents the results. As shown in Column (1), the coefficient of *HOR* is positive and significant at the 5% level (*t*-statistic of 2.31), suggesting that insider investment horizon is positively related to material CSR performance. In comparison, Column (2) shows an insignificant loading on *HOR*, with a *t*-statistic of 1.37, indicating long-horizon insiders do not have significant effects on immaterial CSR performance.

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<sup>18</sup> For more information, see <https://materiality.sasb.org/>

<sup>19</sup> The 11 sectors are consumer goods, extractives and minerals processing, financials, food and beverage, health care, infrastructure, renewable resources and alternative energy, resource transformation, services, technology and communications, and transportation.

<sup>20</sup> Khan, Serafeim, and Yoon (2016) provide details of their hand-map of material CSR ratings in Appendix D, which includes only 6 sectors and 45 industries because the coverage of the SASB Materiality Map was smaller in early years. We extend their classification to all 11 sectors and 77 industries currently covered by the SASB.

The evidence suggests that long-term insiders are more likely to promote CSR performance by engaging in a greater number of financially material CSR activities compared to immaterial ones, which benefits shareholders by increasing potential financial returns. Thus, the positive relation between insider investment horizon and CSR performance may not be subject to agency problems.

### 3.3. Different insiders

In the baseline model, we construct the investment horizon measure at the inside level and include all types of insiders. We find that generally, insider investment horizon is related positively to firm-level CSR performance. However, little is known about whether and how various insiders' investment horizons influence CSR. This question needs to be answered for two reasons. First, given the increasing importance of CSR in recent years, all types of insiders may consider CSR factors when making decisions. Second, the influence of insiders can vary. For example, a CEO is typically more influence than an independent director when it comes to a firm's operations and decision-making in most cases.

To this end, we repeat the baseline model but consider the results for different insiders separately. The results are shown in Table 5. We first consider directors and managers, who account for over 85% of our sample. While directors and managers may have distinct roles and responsibilities, achieving CSR may be a shared objective, as it can create long-term value for the firm. Given this, we expect that both long-horizon directors and managers may have positive effects on CSR performance. Consistent with this expectation, we find that the loadings on *HOR* are positive and significant for both directors and managers, as shown in Column (1) and Column (2)<sup>21</sup>.

[Insert Table 5 here]

Next, we individually test the relation between investment horizon and CSR performance of specific insiders who may make critical corporate decisions. Column (3) shows that long-horizon CEOs have much stronger effects on CSR performance compared to other insiders. The coefficient

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<sup>21</sup> It is noteworthy that the loading on *HOR* is larger and more significant for directors than that for managers. However, drawing a conclusion that directors have a stronger positive influence than managers is not straightforward. This is because many insiders simultaneously serve as both director and managers. In our sample, over 20% of insiders hold these dual roles.

of *HOR* is 0.086, approximately three times than that of the baseline results (0.026), echoing the findings of literature emphasizing the materiality of CEOs in corporate policies (e.g., Bennedsen, Perez-Gonzales, and Wolfenzon, 2020). Column (4) reveals the loading on *HOR* is 0.064, with a *t*-statistic of 1.78, indicating the chairman's investment horizon has positive but weaker effects on CSR performance compared to CEOs. As evidenced in Column (5), CFOs' investment horizons exert no significant effect on CSR. This is surprising because CFOs have needed to play an important role in handling increasing demand for CSR disclosures in recent years. Therefore, one implication is that firms may need to provide more relevant training for CFOs and help them better realize CSR's importance.

### 3.4. Robustness tests

To ensure our primary results are robust to alternative measures of CSR performance and insider investment horizon, firm-level analysis and subsample analysis, we conduct a variety of robustness checks.

**Alternative ESG ratings.** We repeat the baseline analysis by using alternative CSR scores due to the concern about ESG rating divergence across various data providers<sup>22</sup>. Following the suggestion of Berg, Kolbel and Rigobon (2022), we incorporate ESG rating data from other providers besides the KLD to ensure that our conclusion can be generalized with respect to other ESG ratings. Specifically, we construct a CSR score using the ESG rating data from Refinitiv and Sustainalytics. We then replace the dependent variable in the baseline results with these alternative CSR measures. The results are presented in Table IA1 of the Internet Appendix. We find that the insider investment horizon is positively related to the Refinitiv CSR score, as evidenced in Column (1). Similarly, we document a positive relation between *HOR* and Sustainalytics CSR score in Column (2). Taken together, the evidence based on alternative CSR measures may mitigate the concern that our baseline analysis is subject to the well-documented ESG rating divergence and enhance the generalizability of our results.

**Alternative measures of insider horizon.** We consider alternative measures of insider investment horizon, including *7-year HOR*, *5-year HOR*, and *LH*. Compared with the baseline

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<sup>22</sup> Berg, Kolbel and Rigobon (2022) document the low correlation across six prominent ESG rating data providers and attribute the ESG rating divergence primarily to measurement methodology, weight and scope.

measure, *7-year HOR* (*5-year HOR*) is constructed based on the average annual net order flows of insider trading over the past seven years (five years). *LH* is a dummy equaling one if the *HOR* is one, and zero if the *HOR* is between zero and one (excluding). We estimate the baseline model but replace the independent variable of interest (*HOR*) with these alternative measures of insider investment horizon. Panel A of Table IA2 of the Internet Appendix presents the results. We find the results of the robustness tests do not alter regarding two of the three alternative insider investment horizon measures. The only exception is *5-year HOR*, as the loading on *HOR* is not statistically significant despite the positive sign (*t*-statistic of 1.19). One possible explanation may be that the term is too short to define the insider investment horizon, as various incentives can motivate insiders to trade (e.g., vesting policy of restricted equity) in the short term.

**Alternative KLD CSR measures.** We perform various tests to check whether alternative KLD CSR performance measures change our baseline results. We repeat the baseline model using these alternative CSR performance measures as dependent variables. We first consider the raw CSR score, which is calculated by taking the difference between CSR strengths and concerns without being divided by the maximum number of strengths and concerns in each year. Columns (1) in Panel B of Table IA2 of the Internet Appendix tabulates the results. Though the coefficient of *HOR* is positive, it is not statistically significant (*t*-statistic of 1.60). The statistical insignificance may be driven by the biased raw CSR score. As the KLD database updates positive and negative indicators under each subcategory every year, the number of indicators in each subcategory varies considerably across years. This may lead to biased measures of CSR performance when not considering the available number of indicators in each year. Next, to mitigate the concern that our results are biased by zero rating scores that may stem from missing CSR information, we exclude zero CSR rating scores from the sample. Columns (2) in Panel B of Table IA2 presents the results, which do not change compared to the baseline results and thus indicate that our main results are not biased by zero rating scores. We then consider the rank of CSR performance by dividing firms into deciles based on their CSR performance in each year to rule out the concern of universal changes in CSR performance. Columns (3) in Panel B of Table IA2 shows the results remain unchanged when using the rank of CSR performance as the dependent variable.

**Firm-level analysis.** Unlike our baseline analysis that treat insiders heterogeneously and use insider-level investment horizons, we aggregate insider investment horizon at the firm level and

conduct robustness checks using firm-level measures. First, we construct two firm-level measures by calculating the average investment horizon for all insiders within a firm in each year (*average horizon*) and the ratio of the number of insiders with an insider investment horizon (*HOR*) equaling one on the number of all insiders for each firm in each year (*Frac\_LH*). These results are presented in Table IA3 of the Internet Appendix. As presented in Column (1) of Table IA3, the coefficient on *average horizon* is positive and significant, indicating that average investment horizon still is associated positively with CSR performance. In Column (2), we replace the independent variable of interest of the fraction of long-horizon insiders for a firm (*Frac\_LH*) and find that the higher ratio of long-horizon insiders is related to better CSR performance because of the positive and significant coefficient on *Frac\_LH*.

Next, we construct more measures of insider investment horizon based on insiders' trading patterns. According to Narayanan (1985), insiders tend to focus on short-term performance when they possess private information, i.e., taking advantage of private information may indicate that insiders are less likely to pursue long-term value. In this spirit, we focus on insiders with opportunistic trading behavior following Ali and Hirshleifer (2017). We define *opportunistic insiders* as the type of insiders who trade profitably before quarterly earnings announcements (QEAs), which may suggest that insiders frequently use private information. We find a negative relation between the fraction of opportunistic insiders (*Frac\_opportunistic*) and CSR performance, as evidenced in Column (3) of Table IA3 of the Internet Appendix, suggesting that firms with opportunistic insiders, who may be less willing to pursue long-term value, tend to exhibit a lower level of CSR performance. Finally, we analyze the timing of insider trading and defined insiders with persistent trading timing (i.e., those who always trade in the same calendar year across years) as *routine insiders*, building on Cohen, Malloy, and Pomorski (2012), who show that routine insiders' trades include less information content than insiders who do not trade with persistent timing. We then calculate the fraction of routine insiders in each firm and posit that routine insiders are less likely to take advantage of private information and, thus, are more likely to pursue long-term value. Consistent with our hypothesis, we find the coefficient of *Frac\_routine* is positive and significant as presented in Column (4), indicating that the higher ratio of routine insiders within a firm may lead to better CSR performance.

**Subsample period analyses.** In addition to using alternative measures for CSR performance

and insider horizon, we also conduct a subsample analysis by splitting our sample into two parts: 1996 to 2005 and 2006 to 2015. As CSR has become increasingly important to firms' decision-making processes in recent years, we expect our baseline results are more likely to materialize in the latter period. Table IA4 of the Internet Appendix tabulates the results of this subsample analysis. Columns (1) shows the results from the period 1996 to 2005 have no significance. In contrast, we find our baseline results remain similar in the latter period based on Columns (2). These results are consistent with our expectation and indicate that CSR has begun to materialize in recent years.

#### **4. Identification strategy**

In this section, we conduct the analyses to support a causal interpretation for the baseline results and discuss the corresponding empirical results. Although we implement a variety of precautions to ensure the positive association between insider investment horizon and CSR performance is robust, our findings may still be subject to potential endogeneity. First, omitted variables may drive the results despite a variety of firm-level and insider-level control variables. For example, compensation contracts that encourage insiders to pursue long-term goals could simultaneously lead to longer insider investment horizon and better firm-level CSR performance. Second, the positive relation may be spurious due to reverse causality, because better CSR performers are more likely to attract talents who wish to pursue long-term value compared to firms with worse CSR performance. To address the endogeneity problem and facilitate a causal interpretation, we adopt two types of potential shocks – the reductions of managerial career horizon and Inevitable Disclosure Doctrine (IDD) – that may affect the willingness of insiders to pursue long-term value.

##### **4.1. The effects of CEO career concerns**

Managerial career horizon can play an important role in shaping a manager's short-term policies (e.g., Holmstrom, 1999). Managers with a shorter career horizon are more likely to engage in myopic activities, such as reducing long-term investments and R&D inputs. In the context of our setting, insiders may become less willing to pursue long-term value when they suffer a reduction in career horizon, thereby reducing CSR investments and deteriorating CSR performance.

To explore the effects of managerial career horizon reduction, we focus on the exogenous changes to managerial career horizon driven by the serious illness (e.g., cancer) of CEOs or their

close relatives, or by the death of the CEOs' close relatives, following Aktas, Boone, Croci, and Signori (2021). Although these unforeseeable events are relatively exogenous, they have significant impacts on corporate policies. Aktas et al. (2021) document that affected CEOs have a shorter time in office and higher turnover. Most importantly, firms with affected CEOs exhibit a lower level of capital expenditures and R&D expenses but a higher level of repurchase and profitability, suggesting that these affected CEOs may yield short-term performance at the expense of long-term firm value. In the context of our study, these exogenous events that raise managerial career concerns may impede insiders from pursuing long-term value, leading to a reduced insider investment horizon.<sup>23</sup> Consequently, these events would weaken the positive relation between insider investment horizon and CSR performance, even though these unforeseeable events may not directly influence CSR activities.

To explore, we adopt a difference-in-difference-in-difference approach to examine whether and how reductions in managerial career horizon influence firms' CSR policies. The difference-in-difference-in-difference model is as follows:

$$CSR_{j,t+1} = \beta_0 + \beta_1 HOR_{i,j,t} \times CEO\_Careershock_{j,t} + \beta_2 HOR_{i,j,t} + \beta_3 CEO\_Careershock_{j,t} + \beta_4 Treated\_Firm_j + \gamma_1 X_{j,t} + \gamma_2 Y_{i,j,t} + \delta Industry_k + \theta Year_t + \varepsilon_{i,j,t}, \quad (2)$$

in which *CEO\_Careershock* indicates the post-event period after a reduction in managerial career horizon, taking the value of one if a firm was hit by an event that reduces CEO career horizon, or zero otherwise. As such, the indicator *CEO\_Careershock* is equivalent to a *Post*×*Treatment* indicator in a conventional difference-in-difference setting. As the CEO or firm fixed effect is not controlled in the model, we add the indicator *Treated Firm* in the model, which is equal to one if a firm suffers a reduction in CEO career horizon, regardless of time. To build the sample, we first manually match these events with our sample and benchmark those treated firms against up to 10 peers with similar total assets in the same industry. We then require all the observations in the sample to be centered from -3 to +3 years around the occurrence of the events. Finally, we identify 15 events that change managerial career horizon in our sample.<sup>24</sup>

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<sup>23</sup> Put more clearly, CEOs affected by such unexpected career disruptions tend to face increased turnover and have shorter tenures. This situation might prompt them to prioritize short-term gains. As a result, they could adjust their insider trading behaviors to secure short-term profits before exiting the company, which would manifest as a decreased value of *HOR*.

<sup>24</sup> The detailed event data including 49 events are provided in the Appendix B of Aktas et al. (2021).

The results are presented in Table 6. The key variable of interest is the interaction term of *CEO\_Careershock* and *HOR*. The coefficient of the interaction term ( $HOR \times CEO\_Careershock$ ) measures how insider investment horizon affects CSR performance in response to events that reduce managerial career horizon. As insiders may have shorter investment horizons due to these unforeseeable events, we expect the coefficient of the interaction term to be negative. Indeed, we find the interaction term's coefficient to be negative and significant, as presented in Column (1), when only considering CEOs of treated firms and their matched control firms. This finding suggests that an exogenous shock-reducing CEO career horizon may attenuate the positive relation between insider investment horizon and CSR performance, which is consistent with our conjecture. We also consider all insiders in this matched sample. The idea is that reductions in CEOs' career horizons also may shorten other insiders' horizons temporarily. Based on Aktas et al. (2021), firms that CEO career horizon reduction affects tend to have a higher level of tournament for the future CEO position among other top managers, as affected CEOs may delegate more tasks to these managers. In this case, these managers may attempt to boost short-term performance to demonstrate their ability and compete to be the next CEO, indicating that they temporarily may have shorter horizons. As presented in Column (2), we include all insiders from treated firms and find a negative and significant coefficient for the interaction term's loading, suggesting that firms hit by reductions in CEO career horizon exhibit a deteriorated positive relation between insider investment horizon and CSR performance.<sup>25</sup> Comparing the coefficients of the interaction term in Columns (1) and (2), we find that each coefficient becomes stronger in terms of statistical significance when considering all insiders, which may corroborate the argument that career horizon reductions may influence not only CEOs' horizons, but also those of other insiders.<sup>26</sup>

[Insert Table 6 here]

Recent studies have raised concerns about the staggered difference-in-difference method, pointing to possible biases estimates stemming from heterogeneous treatment effects (e.g., Baker,

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<sup>25</sup> These results are not qualitatively changed when adding individual-level effects, particularly for the analysis including all insiders.

<sup>26</sup> Though the coefficient of *Treated Firm* is positive and significant as shown in Column (2), this does not suggest a failure of parallel trend as we include all insiders in Column (2) so the coefficient could be biased. Rather, we should refer to the coefficient of *Treated Firm* in Column (1) – it is not significant – suggesting that treated and control firms do not exhibit a difference in firm-level CSR.



Larcker, and Wang, 2022; Roth et al., 2023). The issue arises because the estimations include both “good comparisons” (between treated and not-yet-treated units) and “bad” comparisons (where both units having already received treatment). To mitigate this concern, we apply the stacked regression approach (Baker, Larcker and Wang, 2022). This method ensures that the control groups are “clean”, only comprising units that have never been treated. The evidence presented in Column (3) and (4) reinforces the robustness of our findings using the stacked regression approach, whether considering only CEOs or all insiders in our sample. In addition, we test the validity of the parallel trend assumption by examining whether and how the CEO career concern shock influences the relation between insider investment horizon and CSR around its effective timing. Following Aktas et al. (2021), we conduct the dynamic analysis and present the results in Table IA5 of the Internet Appendix. We do not find evidence of pre-existing trends when only considering CEOs and all insiders, as shown in Column (1) and (2) of Table IA5, respectively.

Overall, the difference-in-difference-in-difference regression results based on managerial career horizon illustrate that CSR performance may deteriorate in response to unforeseen negative shocks to insider investment horizon, thereby supporting a causal interpretation of the relation between insider investment horizon and CSR performance.

#### 4.2. The effects of Inevitable Disclosure Doctrine

Next, we employ the staggered rejection of the inevitable disclosure doctrine (IDD) by multiple states as additional exogenous shocks to insider investment horizon. The IDD aims to enhance the protection of trade secrets by preventing employees with access to trade secrets from working for rival firms, leading to lower labor market mobility. In our sample, over 85% of insiders are top managers and directors who very likely work with trade secrets and, therefore, are affected by IDD. As such, insiders may have fewer outside opportunities under IDD, resulting in higher job loss costs and managerial career concerns. Based on this argument, Li, Shevlin, and Zhang (2022) document that insiders engage in tax avoidance activities to entrench themselves in response to adoption of IDD, indicating that insiders may focus on short-term outcomes due to increased career concerns driven by IDD. However, insiders would have more outside opportunities and decreased career concerns after rejection of IDD and, therefore, would become more willing to pursue long-term value. Furthermore, Na (2020) finds that rejection of IDD leads to less relative performance

evaluation (RPE) used in managerial compensation, which may reduce pressure for insiders to achieve short-term goals and encourage them to pursue long-term value because their compensations are linked heavily to systematic performance that is beyond their control. Collectively, the rejection of IDD may strengthen the positive relation between insider investment horizon and CSR performance, as it prompts insiders to focus on long-term value.

To explore, we build the regression model based on a difference-in-difference-in-difference approach as follows:

$$CSR_{j,t+1} = \beta_0 + \beta_1 HOR_{i,j,t} \times IDD_{s,t} + \beta_2 HOR_{i,j,t} + \beta_3 IDD_{s,t} + \beta_4 Treated\_States_s, \\ \gamma_1 X_{j,t} + \gamma_2 Y_{i,j,t} + \delta Industry_k + \theta Year_t + \varepsilon_{i,j,t}, \quad (3)$$

Compared with the baseline regression model, we add the indicators to identify whether state  $s$  has rejected the IDD (*IDD Rejection*) and their interaction terms with *HOR*. *IDD Rejection* takes the value of one if the state in which the firm is headquartered has rejected the IDD before the current year, or zero otherwise. In this case, this *IDD* indicator plays the role of a *Post* × *Treatment* indicator in a conventional difference-in-difference setting. We also add the indicator *Treated\_States*, which is equal to one if one state rejects IDD, regardless of time frame, as we do not include state or firm fixed effect in the model.

The key variable of interest is the interaction terms *HOR* and *IDD Rejection*: the difference-in-difference-in-difference estimator. Intuitively, the positive effects of insider investment horizon on CSR are likely to be enhanced by the rejection of IDD, as it may lengthen insider investment horizon. This implies that the coefficient of the interaction term, which captures the change in CSR performance to insider investment horizon in response to the rejection of the IDD, should be positive.

[Insert Table 7 here]

In line with our expectations, Column (1) of Table 7 indicates that the loading on the interaction term between *HOR* and *IDD Rejection* is 0.055, with a  $t$ -statistic of 2.36, suggesting that a stronger positive relation exists between insider investment horizon and CSR performance in response to

positive shocks to insiders' willingness to pursue long-term value.<sup>27</sup> To mitigate the concern of potential estimation bias due to staggered treatment timing in our setting, we repeat the results in Column (1) using a stacked regression approach, as advised by Baker, Larcker and Wang (2022). As shown in Column (2), our findings remain consistent and robust when using the stacked regression approach.

We also conduct dynamic analysis to test the validity of the parallel trend assumption. In a similar spirit of Na (2020), we examine the timing of changes in the relation between CSR and insider investment horizon relative to the timing of rejections of the IDD. The year that one state rejects IDD is regarded as the reference year. We tabulate the results in Table IA6 of the Internet Appendix and find no evidence of a pre-existing trend.

To further validate the IDD treatment effects, we conduct the analysis based on the adoption of IDD. Intuitively, the positive relation between insider investment horizon and CSR performance should be weaker under the adoption of IDD. This is because insiders may encounter fewer external opportunities and increased career concerns, potentially diminishing their willingness to pursue long-term value. Indeed, we find this is the case as the interaction term between *HOR* and *IDD Adoption* contrasts sharply with results based on the rejection of IDD, as evidenced in Table IA7 of the Internet Appendix.<sup>28</sup>

## 5. Cross-sectional analyses

Having established a causal link between insider investment horizon and firm-level CSR performance, we next explore the mechanisms through which insider investment horizon affects CSR performance. To this end, we design multiple tests to examine the cross-sectional heterogeneity of our main results with respect to firm-level and insider-level characteristics, respectively. If the insider investment horizon indeed reflects insiders' desire to pursue long-term value, we would expect that our main results are stronger (weaker) with factors that encourage

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<sup>27</sup> This result does not change when adding individual-level fixed effects.

<sup>28</sup> Although the analysis based on the IDD supports a causal interpretation, we caution that the rejection and adoption of the IDD may not be an ideal example of an exogenous shock. Flammer and Kacperczyk (2019) demonstrate that firms improve their CSR after the rejection of the IDD to retain talent and avoid trade secret spillover. Nevertheless, our results complement Flammer and Kacperczyk (2019) by revealing that insiders are more willing to pursue long-term value as captured by a longer insider investment horizon, after the rejection of IDD. This indicates another potential channel through which the rejection of the IDD can promote a firm's CSR strategies.

(discourage) insiders' willingness to pursue long-term value.

### 5.1. Institutional investors

We first consider institutional investors, as they play vital roles in shaping insiders' horizon. Long-horizon institutional investors are usually more patient and focus more on long-run performance compared to short-horizon investors; therefore, long-horizon institutional investors are more likely to encourage insiders to engage in activities that may create long-run value (e.g., Bushee, 2001; Cadman and Sunder, 2014). As such, we expect a stronger (weaker) positive relation between insider investment horizon and CSR performance when a firm's institutional investors have longer (shorter) investment horizon.

Two measures are employed for institutional investor investment horizon. The first is institutional investor turnover (Gasper, Massa, and Matos, 2005), which is calculated using data from the Thomson Reuters Institutional Holdings (13F) database. We first analyze the turnover rate of each institutional investor and construct firm-level investor turnover by calculating the weighted average of total portfolio turnover rates of the firm's all investors over the previous four quarters (*Turnover*). The second measure is churn rate (Yan and Zhang, 2009). Similar to turnover, we first calculate investor-level churn rate and construct a firm-level churn rate using a value-weighted method (*Churn*). For these measures, higher value indicates shorter institutional investors' investment horizon.

As shown in Table 8, Column (1) reports the results of Gasper et al. (2005) turnover measure. Compared to the baseline model, we add the interaction term of *HOR* and *Turnover* together with *Turnover*. The interaction term is the variable of interest. The coefficient of the interaction term ( $HOR \times Turnover$ ) is negative and significant, with a *t*-statistic of -1.88, confirming that the positive relation between insider investment horizon and CSR performance is weakened by short-term institutional ownership. In the same vein, we estimate the baseline model again by adding the interaction term of *Churn* and *HOR* together with *Churn*. As shown in Column (2), we find that the positive effects of insider investment horizon on CSR performance are weaker when short-term institutional ownership is higher, because the loading on the interaction term ( $HOR \times Churn$ ) is negative and significant at the 1% level. Consistent with our conjecture, we demonstrate that the baseline results are weaker when more short-term institutional investors hold stakes as these short-

term investors may impede insiders from pursuing long-term value such as CSR.

[Insert Table 8 here]

Furthermore, SRI investors, who are proponents of CSR investments, are usually patient and willing to consider the combined effects of financial returns and social objectives (e.g., Bialkowski and Starks, 2016), suggesting that they tend to have longer investment horizon than their non-SRI peers. Thus, we expect the positive relation between insider investment horizon and CSR performance is stronger when SRI investor ownership is higher.

We define SRI institutional investors as signatories of the United Nations Principles for Responsible Investment (UNPRI), as they have committed to incorporating ESG issues into investment decisions actively and engaging in prosocial activities. Launched in 2006, only 32 organizations initiated the program, but the number of signatories has increased exponentially to 3,038, with about \$103.4 trillion of assets under management in 2020. UNPRI aims to become the world's leading proponent of responsible investment and establish a sustainable global financial system. To achieve these goals, it has outlined six principles for responsible investment.<sup>29</sup> Consistent with UNPRI goals, Dyck et al. (2019) find that institutional investors who are UNPRI signatories have stronger positive effects on CSR performance of their portfolio firms compared to non-signatories.

We manually match UNPRI signatories with institutional investors from the Thomson Reuters Institutional Holdings (13F) database and calculate ownership of UNPRI signatories for each firm. We then estimate the baseline model by including the interaction term of UNPRI signatories' ownership (*UNPRI*) and insider investment horizon (*HOR*) together with *UNPRI*. The results are reported in Column (3). The loading on the interaction term (*HOR*×*UNPRI*) is positive and significant at the 1% level, showing that UNPRI signatories' ownership enhances the positive relation between insider investment horizon and CSR performance.

## 5.2. Compensation contracts

We investigate whether and how insiders' compensation contracts alter our main results, as compensation contracts may affect insiders' desire to pursue long-term value (e.g., Gopalan et al.,

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<sup>29</sup> For more information, see <https://www.unpri.org/pri/what-are-the-principles-for-responsible-investment>.

2014; Edmans, Fang, and Lewellen, 2017). Long-term compensation contracts can align the interests of insiders with long-term value, thereby encouraging insiders to pursue long-term value.

Two characteristics of insiders' compensation contracts are considered, the first of which is the sensitivity of insiders' wealth to stock volatility (*Vega*). Coles, Daniel, and Naveen (2006) find that insiders with higher *Vega* invest more in R&D, indicating that *Vega* can encourage insiders to take long-run risks and pursue long-term value. Accordingly, we expect that *vega* can enhance the positive effects of insider investment horizon on CSR. *Vega* is defined as the change in the dollar value of the executive's wealth for a 0.01 change in the annualized standard deviation of stock returns. Using insiders' compensation data from ExecuComp, we calculate *Vega* following Coles et al. (2006). Another characteristic related to the willingness of insiders to pursue long-term value is pay duration (Gopalan et al., 2014). Longer pay duration is associated with higher R&D intensity and lower earnings management, suggesting that it can encourage insiders to pursue long-term value. As such, we expect that our main results are stronger when an insider's pay duration is longer. Following Gopalan et al. (2014), we calculate the duration of insider as the weighted average duration of four primary components (salary, bonus, restricted stock, and options) of an insider's pay using data from the Institutional Shareholder Services (ISS) Incentive Lab.<sup>30</sup>

[Insert Table 9 here]

We first estimate the baseline model by including the interaction term of the sensitivity of insiders' wealth to stock volatility (*Vega*) and insider investment horizon (*HOR*) together with *Vega*. Column (1) of Table 9 tabulates the results. The variable of interest is the interaction term. Consistent with our prediction, we find the coefficient of the interaction term ( $HOR \times Vega$ ) is positive and significant at the 1% level, suggesting that the positive effects of insider investment horizon on CSR performance are stronger when an insider's *Vega* is higher.<sup>31</sup> We then repeat the

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<sup>30</sup> The ISS Incentive Lab compensation database provides data beginning in 1998. Our pay duration measure is constructed from 2006 due to the availability of detailed vesting information regarding insiders' restricted stocks and options.

<sup>31</sup> Gopalan, Milbourn, Song, and Thakor (2014) argue that *Vega* may not fully capture the duration component of pay. In other words, it is unclear whether a high *Vega* incentivizes managers to take more risk in the long term or the short term. Therefore, it is essential to consider managers' alignment with short-term performance, such as through vesting schedules. To explore this issue, we conduct a cross-sectional analysis focusing on *Vega* while incorporating controls for managerial pay-performance sensitivity (*Delta*), which directly measures managerial incentives in the short run. We find qualitatively similar results after accounting for both *Delta* and its interaction with insider investment horizon.

baseline model, adding the interaction term of pay duration (*Pay duration*) and insider investment horizon (*HOR*) together with *Pay duration*. The results are presented in Column (2). The loading on the interaction term ( $HOR \times Pay\ duration$ ) is positive and significant at the 1% level, indicating that pay duration can enhance the positive effects of insider investment horizon on CSR performance.<sup>32</sup>

## 6. Real effects

To further explore how long-term insiders can promote CSR performance, we examine the real effects of insider investment horizon on various raw CSR metrics. These analyses not only add evidence regarding the channels through which insider investment horizon affects CSR performance, but also improve the robustness of our main results by using alternative CSR measures in addition to CSR rating scores.

### 6.1. Toxic releases

First, we test whether firms with long-horizon insiders are associated with a lower level of toxic releases. The level of toxic releases is a crucial metric used by prior studies that assess the real impact on CSR.<sup>33</sup> If long-horizon insiders indeed have positive real effects on CSR, we expect a negative relation between insider investment horizon and toxic releases.

We retrieve toxic release data from the Toxics Release Inventory (TRI) database administered by the United States Environmental Protection Agency (EPA). In response to public concern surrounding human health and the ambient environment, Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI in 1986, which requires facilities with 10 or more employees using one of approximately 800 chemicals to report their annual quantities of both on-site and off-site toxic releases.<sup>34</sup> Nevertheless, the TRI database only covers

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<sup>32</sup> Apart from the characteristics of institutional investors and compensation contracts, we also examine the heterogeneity of our baseline results with respect to different levels of antitakeover pressure, as it is one of the major sources of managerial short-termism (Stein, 1998). As evidenced in Table IA8 of the Internet Appendix, we find that the relation between insider investment horizon and CSR is stronger under less takeover pressure, as proxied by the enactment of business combination law (BC law). One caveat for the analysis is that antitakeover laws, including BC law, may have weak real effects on takeovers, since companies can defend against hostile takeovers by adopting a poison pill even in the absence of standard antitakeover laws (Catan and Kahan, 2016).

<sup>33</sup> For example, Kim, Wan, Wang, and Yang (2019) document negative effects of local institutional ownership on toxic releases. Xu and Kim (2022) find that toxic releases decrease under relaxed financial constraints.

<sup>34</sup> In general, the TRI database includes three main types of chemicals that may cause 1) cancer or other chronic

the economic sectors comprising the roughly 400 industries distinguished by a six-digit NAICS code. Although TRI data are self-reported by facilities, the database is reliable, as EPA provides report training for facilities and conducts audits to mitigate misreporting concerns.

We first examine the relation between insider investment horizon and total toxic releases in future three years, calculated as the natural logarithm of one plus one firm's total quantity of toxic chemical releases in pounds (*total releases*). The results are presented in Panel A of Table 10. We document firms with long-horizon insiders exhibit a lower level of toxic releases in the future three years. Next, we divide the total releases into on-site and off-site releases and examine insider investment horizon's impacts separately. We present corresponding results in Panels B and C of Table 10, respectively. We find long-horizon insiders tend to reduce the future on-site releases but not the off-site releases. This finding is consistent with Kim, Wan, Wang, and Yang (2019), who document that firms care more about on-site releases because of their social ties with the local community.

[Insert Table 10 here]

One caveat of our analysis is that, without considering the toxicity of the releases, we cannot accurately evaluate the efforts made by long-horizon insiders to reduce toxic releases. Some chemical releases are highly toxic and may pose significant risks to public health, while others are relatively inert and less harmful. In this case, long-horizon insiders are expected to focus on reducing the releases of highly toxic chemicals. To explore, we construct two toxic release measures which incorporate the toxicity of releases. First, we construct the RSEI hazard (i.e., toxicity-weighted release) using the EPA Risk-Screening Environmental Indicators (RSEI) Model<sup>35</sup>. Specifically, the RSEI hazard is calculated as the chemical release in pounds, multiplied by a chemical- and exposure route-specific toxicity weight. Second, we calculate the release of harmful chemicals listed in EPA Integrated Risk Information System (IRIS) in a similar spirit of Akey and Appel (2020). We estimate the baseline model by replacing the dependent variable with these two toxic releases measures. The results are presented in Table IA9 of the Internet Appendix. As shown

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human health effects, 2) significant adverse acute human health effects, or 3) significant adverse environmental effects. Currently, 770 chemicals within 33 chemical categories (e.g., air pollution, ground pollution) are covered.  
<sup>35</sup> For details about Risk-Screening Environmental Indicators (RSEI) Model, see <https://www.epa.gov/rsei/learn-about-rsei>.



in Panel A, we find evidence that firms with long-term insiders are likely to have a lower level of RSEI hazard in the future one year. Similarly, our analyses in Panel B reveal that long-horizon insiders tend to reduce the level of harmful release in the future three years. Collectively, our analysis using toxicity-weighted release measures confirms that long-horizon insiders make efforts to reduce highly toxic release.

## 6.2. Compliance violations

We then investigate whether firms with long-term insiders are less likely to commit compliance violations and receive fewer penalties from violations. Firms with better CSR performance as reflected by CSR rating score may suffer less from CSR compliance violations. As such, our expectation is that firms with long-horizon insiders are less likely to commit CSR violations and have fewer CSR violation penalties.

CSR violation data are obtained from the Violation Tracker database, established by the non-profit organization Good Jobs First. Starting in 2000, the database collects a wide range of violations resolved by more than 300 federal and local agencies<sup>36</sup> with total penalties of around \$720 billion. These violations are classified into nine types: competition, consumer protection, employment, environment, finance, government contracting, healthcare, workforce safety, and miscellaneous. Following Raghunandan and Rajgopal (2021), we restrict the sample to ES-related violations by including three types of violations: environment, employment, and workforce safety. These ES violations comprise the vast majority (over 90%) of violations in the database.

[Insert Table 11 here]

The dependent variable in the baseline model is replaced with the violation indicator (*CSR violation indicator*) or the dollar amount of violation penalties (*CSR violation penalties*) in the next three years. If a firm has committed at least one CSR compliance violation in a year, the violation indicator takes the value of one, or zero otherwise. The dollar amount of violation penalties denotes the total amount of CSR violation penalties (in millions) for each firm in a year's time. We tabulate

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<sup>36</sup> For example, workforce safety violations are reported by the Occupational Safety and Health Administration (OSHA) and the Labor Department Wage and Hour Division (WHD); meanwhile, environment-related violations are reported by the Environmental Protection Agency (EPA). For the full list of agencies, see <https://www.goodjobsfirst.org/violation-tracker-data-sources>.

the results in Table 11. As presented in Column (1) of Panel A, firms with long-horizon insiders are less likely to have CSR violations recorded in the Violation Tracker database during the next year because the loading on *HOR* is negative and significant when estimating a probit specification. Nevertheless, we do not find that firms with long-horizon insiders are less likely to commit CSR violations in two or three years given the insignificant coefficient of *HOR*, as evidenced in Columns (2) and (3). In Panel B, we narrow the sample to firms with CSR violations and the corresponding penalties recorded in the Violation Tracker database, and use the dollar amount of violation penalties as the dependent variable. We find that the insider investment horizon is related negatively to CSR violation penalties during the next year as the loading on *HOR* is negative and significant, as presented in Column (1). Similar to the violation indicator, we do not find a significant relation between insider investment horizon and future two- and three-year CSR violation penalties despite negative coefficients in Columns (2) and (3). One possible explanation for the insignificant relation between insider investment horizon and future violation measures (i.e., violation indicator and penalties) may be the time-variant regulation and investigation intensity, which make it difficult for long-horizon insiders to anticipate whether the regulation and investigation of CSR violations will be more or less stringent in the future. In this case, they only can take efficient measures to reduce the probability of committing violations and violation penalties during the most recent period, but not future periods.

### 6.3. Employee satisfaction

Employee satisfaction can be incorporated into overall CSR performance. Our expectation is that firms with long-horizon insiders tend to have a higher level of employee satisfaction. To explore this idea, we refer to the list of the “Best 100 Companies to Work for in America” (“Best 100”), initially produced by the Great Place to Work Institute. The list was first published in a book in 1984, updated in 1993, and has been published in *Fortune* magazine every January since 1998. For example, Google has been ranked the number one on the list in the consecutive years from 2012 to 2017. Following Edmans (2011), we define firms listed on the “Best 100” as those with high employee satisfaction.<sup>37</sup> The dummy variable (*Best 100 indicator*) takes the value of one if the

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<sup>37</sup> We appreciate Alex Edmans for sharing the “100 Best Companies to Work for in America” list on

firm is on the list in a given year, and zero otherwise.

[Insert Table 12 here]

The results are presented in Table 12. In Column (1), we estimate a probit specification based on the baseline model, replacing the dependent variable with *Best 100 Indicator* during the next period. We find the coefficient of *HOR* to be positive and significant at the 1% level, indicating that firms with long-term insiders are more likely to be included in the *Best 100*. Similarly, we demonstrate that firms with long-horizon insiders are more likely to be listed in the *Best 100* for the next two and three years given the positive and significant coefficient, as evidenced in Columns (2) and (3).

#### 6.4. RepRisk incidents and index

Finally, we explore whether insider investment horizon affects ESG incidents and exposure to ESG risks. Intuitively, firms with long-horizon insiders are likely to better manage ESG risks and incidents. Thus, we expect that insider investment horizon is negatively related to ESG incidents and ESG risk exposure.

We obtain firm-level data on ESG incidents and risk exposure from RepRisk, a comprehensive database focusing on ESG and business risks. Using advanced machine learning algorithms, RepRisk screens more than 100,000 media, regulatory, and commercial documents in 23 different languages to search for ESG incidents since 2007. We adopt two measures from RepRisk. The first measure is the number of ESG incidents, which is considered objective as it is less likely to be manipulated by corporate insiders or data providers. The second measure is the RepRisk index (RRI), which is calculated by a proprietary algorithm based on different dimensions of ESG incidents. The index quantifies a firm's risk exposure to ESG issues. Both measures are reported on a monthly basis. We count the total annual number of ESG incidents and calculate the annual average RRI, in order to align with our yearly insider investment horizon measure.

[Insert Table 13 here]

We regress the number of ESG incidents and RRI in the next three periods on insider

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<https://alexedmans.com/data/>.

investment horizon with the various control variables used in our baseline regression. We present the results in Table 13. In Panel A, we find that the *HOR* coefficient is negative and significant, suggesting that firms with long-horizon insiders tend to have fewer ESG incidents, as presented in RepRisk. As evidenced in all columns of Panel B, the *HOR* coefficients are negative and significant for all three future periods, indicating a negative relation between insider investment horizon and the RepRisk index.

## 7. Conclusion

The effects of CSR may not be realized in the short run. Thus, a commitment to CSR may require a long-term perspective. In this paper, we investigate whether and how insider investment horizon, the reflection of insiders' desire to pursue long-term value, affects firm-level CSR performance. Consistent with CSR's long-term perspective, we find a positive relation between insider investment horizon and CSR performance. Furthermore, we find that good internal corporate governance, rather than selfish agency motives, is likely to drive the documented positive relation between insider investment horizon and CSR performance.

To support a causal interpretation for the positive relation between insider investment horizon and CSR performance, we use both the managerial career horizon reductions and the staggered rejection and adoption of inevitable disclosure doctrine (IDD) as exogenous shocks. Having employed a difference-in-difference-in-difference approach, we can support a causal interpretation for the positive relation between insider investment horizon and CSR performance.

Next, we corroborate the argument that insider investment horizon captures the desire of insiders to pursue long-term value by using cross-sectional analyses. Specifically, we show that the positive effects of insider investment horizon on CSR performance are stronger when long-term institutional ownership and SRI institutional ownership are higher, when insiders' Vega and pay duration are higher, and when firms face less takeover pressure.

Finally, we test the real effects of insider investment horizon using raw CSR metrics. We document that firms with long-horizon insiders have a lower level of toxic releases (especially on-site toxic releases), a lower probability of committing CSR compliance violations, fewer penalties for CSR violations, a higher probability of becoming firms with high employee satisfaction and a lower level of ESG-related incidents and risk exposure.

Overall, our paper provides new evidence on the determinants of CSR and supports the view that CSR requires long-term commitment. Given the increasing importance of CSR in financial markets, our findings are practically relevant and provide important insights for firms and their key stakeholders. The results show that firms should implement long-run policies to shape their key stakeholders' long-term perspectives. These long-term perspectives can help firms improve their CSR practices and achieve their CSR goals.

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## Appendix A. Variable Construction

Variable	Definition
<b><u>CSR variables</u></b>	
<b>CSR</b>	Strengths minus Concerns (Source: KLD).
<b>Strengths</b>	The sum of environment, community, employee relation, diversity and product strengths scaled by maximum number of strength indicators in each category in a given year (Source: KLD).
<b>Concerns</b>	The sum of environment, community, employee relation, diversity and product concerns scaled by maximum number of concern indicators of each category in a given year (Source: KLD).
<b>Material</b>	The CSR score that are financially material as defined by the hand-mapped industry-specific guidelines following SASB and Khan, Serafeim, and Yoon (2016) (Source: KLD).
<b>Immaterial</b>	The CSR score that are financially immaterial as defined by the hand-mapped industry-specific guidelines following SASB and Khan, Serafeim, and Yoon (2016) (Source: KLD).
<b>Refinitiv CSR score</b>	Following Dyck et al. (2019), the Refinitiv CSR score is calculated as the natural logarithm of raw CSR score. The raw CSR score is defined as the average of raw Refinitiv environment score and social score (Source: Refinitiv)
<b>Sustainalytics CSR score</b>	The average of raw Sustainalytics environment score and social score (Source: Sustainalytics).
<b>Raw</b>	The sum of environment, community, diversity, employee relations, and product strengths deducts after deducting the sum of environment, community, diversity, employee relations, and product concerns in a given year (Source: KLD).
<b>Non-zero</b>	A dummy takes the value of one if the CSR measure is not equal to zero and zero otherwise (Source: KLD).
<b>Rank</b>	Firms are sorted into deciles based on CSR performance measure each year (Source: KLD).
<b><u>Other firm-level variables</u></b>	

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<b>Size</b>	Natural logarithm of total assets (AT) (Source: Compustat).
<b>Cash ratio</b>	Cash holdings plus short-term investments (CHE) scaled by total assets (AT) (Source: Compustat).
<b>Capex ratio</b>	The ratio of capital expenditures (CAPX) over total assets (AT) (Source: Compustat).
<b>Tangibility</b>	The net property, plant and equipment (PPENT) divided by total assets (AT) (Source: Compustat).
<b>Tobin's Q</b>	The ratio of total assets (AT) plus market value (CSHO*PRCC_F) minus book equity (CEQ+TXDB) over total assets (AT) (Source: Compustat).
<b>Leverage</b>	The sum of long-term debt (DLTT) and current debt (DLC) deflated by total assets (AT) (Source: Compustat).
<b>ROA</b>	The ratio of operating income before depreciation (OIBDP) over total assets (AT) (Source: Compustat).
<b>R&amp;D intensity</b>	The ratio of research and development expenses (XRD) over total assets (AT). We Assign zeros to missing R&D values. (Source: Compustat).
<b>A&amp;D intensity</b>	The ratio of advertising expenditures (XAD) over total assets (AT). Missing values of advertising expenses are assigned zeros. (Source: Compustat).
<b>Blue</b>	A dummy is equal to one if the firm is headquartered in a state supporting the Democratic Party in the US president election (Source: Compustat).
<b>Prior-year return</b>	Annual stock return over the past twelve months (Source: CRSP)
<b>IO</b>	The annual institutional ownership is defined as the average of percentage of common shares held by institutional investors across four quarters within a year (Source: Thomson Reuters 13F and CRSP).
<b>IDD rejection</b>	A dummy is equal to one if the state that one firm is headquartered rejected the IDD before year $t$ (Source: Na, 2020).
<b>Rejection state</b>	An indicator is equal to one for states rejecting IDD, regardless of time (Source: Na, 2020)

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<b>IDD adoption</b>	A dummy is equal to one during the period that IDD takes effect in the state that one firm is headquartered (Source: Na, 2020).
<b>Adoption state</b>	An indicator is equal to one for states adopting IDD, regardless of time (Source: Na, 2020)
<b>Turnover</b>	Following Gasper, Massa and Matos (2005), we first calculate the investor-level turnover rate in each quarter and then define the firm-level churn ratio as the weighted average of the total portfolio churn turnover of one firm's investors over previous four quarters. (Source: Thomson Reuters 13F and CRSP).
<b>Churn</b>	Following Yan and Zhang (2009), we first calculate the investor-level churn rate in each quarter and then define the firm-level churn ratio as the weighted average of the total portfolio churn rate of one firm's investors over previous four quarters. (Source: Thomson Reuters 13F and CRSP).
<b>UNPRI</b>	The percentage of shares held by institutional investors who have signed the Principles for Responsible Investment (UNPRI) over the total shares outstanding (Source: UNPRI website, Thomson Reuters 13F and CRSP).
<b>RSEI hazard</b>	The natural logarithm of one plus toxicity weighted pollution amount, calculated as the releases for each chemical in pounds, multiplied by a chemical- and exposure route-specific toxicity weight (Source: EPA Risk-Screening Environmental Indicators (RSEI) Model)
<b>Harmful release</b>	The natural logarithm of one plus harmful release in pounds, in which harmful release is defined as the total release of harmful chemicals, listed by EPA's Integrated Risk Information System (IRIS), that are known to cause harm to humans (Source: EPA TRI Toxic Release database and IRIS system)
<b>CSR violation indicator</b>	A dummy takes the value of one if one firm commits CSR violations recorded in Violation Tracker database in a given year and otherwise zero (Source: Violation Tracker database).
<b>CSR violation penalties</b>	The amount of total CSR violation penalties in millions for a firm-year (Source: Violation Tracker database).

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**Best 100 indicator**

A dummy equals one if one firm is listed on Fortune magazine's "Best 100 Companies to work for in America" in each year and otherwise zero (Source: Alex Edman's website)

**ESG incidents**

The number of ESG incidents in a given year (Source: RepRisk)

**RRI index**

The index developed by RepRisk to capture current level of a company's exposure to ESG risks (Source: RepRisk)

**Insider-level variables****STR**

For each insider  $I$  of firm  $j$  at year  $t$ , the trading strength is calculated as:  $STR_{i,j,t} = \frac{P_{i,j,t} - S_{i,j,t}}{VOL_{j,t}}$ .  $P$  ( $S$ ) is the number of shares of firm  $j$  purchased (sold) by insider  $I$  during year  $t$  and  $VOL_{j,t}$  refers to the number trading volume of firm  $j$  during year  $t$ . The aim of this measure is to capture the trading direction of each insider. (Source: Thomson Reuters Insider and CRSP).

**STR\_RK**

The insiders are grouped into quintiles based on their trading strength in each year with assigned values from 0 to 4. To make the measure range between 0 and 1, we scale the values by 4. (Source: Thomson Reuters Insider and CRSP).

**HOR**

Following Akbas, Jiang and Koch (2020), we construct this insider investment horizon measure based on one insider's trading pattern of own-company shares over the previous 10 years. For insider  $i$  of firm  $j$  in year  $t$ , the measure is calculated as follows:

$$HOR_{i,j,t} = \left| \frac{\sum_{T-9}^T IOF_{i,j,y}}{N} \right|$$

Where the net annual insider order flow of insider  $I$  in firm  $j$  at year  $y$ ,  $IOF_{i,j,y}$ , is calculated as  $\frac{P_{i,j,y} - S_{i,j,y}}{P_{i,j,y} + S_{i,j,y}}$ .  $P$  ( $S$ ) is the number of stock-split adjusted shares purchased (sold) of the insider during year  $y$  and  $N$  refers to the number of calendar years that the insider traded over the period from year  $T-9$  to year  $T$ . Overall, the range of HOR lies between zero and one and. Higher value of HOR indicates a longer insider investment horizon for the insider. (Source: Thomson

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	Reuters Insider and CRSP).
<b>Age</b>	The age of one insider in each year (Source: BoardEx).
<b>Tenure</b>	The number of years that an insider works for a given firm (Source: BoardEx).
<b>Gender</b>	A dummy is equal to one if the insider is male and 0 if female (Source: BoardEx).
<b>Netbuyer</b>	A dummy is equal to one if one insider's net purchase in current year is positive, and zero otherwise (Source: Thomson Reuters Insider).
<b>Netbuyer10</b>	A dummy is equal to one if one insider's net purchase over past 10 years is positive, and zero otherwise (Source: Thomson Reuters Insider).
<b>Officer</b>	A dummy is equal to one if one insider takes the position of officer as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
<b>Director</b>	A dummy is equal to one if one insider takes the position of director as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
<b>CEO</b>	A dummy is equal to one if one insider takes the position of CEO as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
<b>CB</b>	A dummy is equal to one if one insider takes the position of board chairman as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
<b>CFO</b>	A dummy is equal to one if one insider takes the position of CFO as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
<b>7-year HOR</b>	The HOR measure is constructed based on one insider's trading pattern of own-company shares over the previous 7 years (Source: Thomson Reuters Insider).
<b>5-year HOR</b>	The HOR measure is constructed based on one insider's trading pattern of own-company shares over

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	the previous 7 years (Source: Thomson Reuters Insider).
<b>LH</b>	LH refers to long-horizon insiders. Following Akbas, Jiang and Koch (2020), we define this dummy variable as one when the HOR measure is equal to one. If HOR measure is between 0 and 1 (excluded), we set this dummy as zero (Source: Thomson Reuters Insider).
<b>CEO Careershock</b>	An indicator is equal to one after a CEO (firm) has suffered events reducing career horizon as documented by Aktas et al. (2021)
<b>Treated Firm</b>	An indicator is equal to one for firms hit by a CEO career shock, regardless of time (Source: Aktas et al., 2021)
<b>Vega</b>	Following Coles, Daniel and Naveen (2006), vega is defined as the dollar change in one insider's wealth to 0.01 change in the annualized standard deviation of the firm's stock return (in millions) (Source: ExecuComp).
<b>Pay duration</b>	Following Gopalan et al. (2014), the pay duration is calculated as the weighted average duration of four components of one insider's pay: salary, bonus, restricted stock and options (Source: Institutional Shareholder Services (ISS) Incentive Lab)

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**Table 1. Summary Statistics**

This table reports the descriptive statistics for the firm-level measures and insider-level measures used in our main regressions. Panel A presents descriptive statistics of primary measure of firm-level CSR performance, decomposed CSR performance, and other firm-level control variables. Panel B reports statistics of insider-level measures, including insider investment horizon, trading strength, and other insider-level control variables. All variables are described in Appendix A. The sample consists of 12,120 firm-year observations and 30,545 insider-year observations from 1996 to 2015.

	N	Mean	SD	Median	P25	P75
Panel A Firm-level measure						
CSR	12,120	-0.06	0.48	0.00	-0.33	0.13
Strengths	12,120	0.24	0.41	0.08	0.00	0.29
Concerns	12,120	0.30	0.35	0.25	0.00	0.50
Material	12,120	-0.03	0.25	0.00	-0.14	0.00
Immaterial	12,120	-0.04	0.34	0.00	-0.33	0.11
Size	12,120	7.56	1.68	7.44	6.36	8.54
Cash ratio	12,120	0.18	0.19	0.11	0.04	0.27
Capex ratio	12,120	0.04	0.05	0.03	0.01	0.06
Tangibility	12,120	0.21	0.22	0.13	0.04	0.29
Tobin's Q	12,120	2.12	1.65	1.64	1.15	2.48
Leverage	12,120	0.19	0.20	0.16	0.03	0.30
ROA	12,120	0.12	0.14	0.12	0.07	0.18
R&D intensity	12,120	0.04	0.08	0.00	0.00	0.05
A&D intensity	12,120	0.01	0.04	0.00	0.00	0.01
Blue	12,120	0.69	0.46	1.00	0.00	1.00
Prior-year return	12,120	0.21	0.72	0.13	-0.08	0.38
IO	12,120	0.75	0.21	0.80	0.64	0.91
Panel B Insider-level measure						
HOR	30,545	0.82	0.29	1.00	0.63	1.00
STR*10 <sup>3</sup>	30,545	-0.72	4.26	-0.14	-0.51	-0.03
Age	30,545	57.91	9.17	57.00	51.00	64.00
Tenure	30,545	15.13	7.18	14.00	10.00	19.00
Gender	30,545	0.93	0.26	1.00	1.00	1.00
Officer	30,545	0.65	0.48	1.00	0.00	1.00
Director	30,545	0.54	0.50	1.00	0.00	1.00
CEO	30,545	0.16	0.37	0.00	0.00	0.00
CB	30,545	0.09	0.29	0.00	0.00	0.00
CFO	30,545	0.08	0.28	0.00	0.00	0.00

### **Table 2. Insider investment horizon and CSR**

This table presents the regression results from a baseline model testing the association between insider investment horizon and overall CSR performance. The dependent variable is the measure of firm-level CSR performance, gauged by MSCI KLD ratings. The independent variables are insider investment horizon—calculated following Akbas, Jiang, and Koch (2020)—and a set of firm-level and insider-level control variables defined in Appendix A. The sample period is 1996–2015. Standard errors are clustered at the insider level, and the t-statistics are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: CSR			
	(1)	(2)	(3)	(4)
HOR	0.071*** (5.59)	0.038*** (3.16)	0.055*** (4.30)	0.026** (2.19)
Size	0.114*** (28.11)	0.126*** (29.55)	0.112*** (27.80)	0.124*** (29.25)
Cash ratio	0.129*** (4.90)	0.130*** (4.83)	0.128*** (4.84)	0.128*** (4.75)
CAPEX ratio	0.098 (0.98)	0.125 (1.23)	0.134 (1.35)	0.135 (1.34)
Tangibility	-0.133*** (-4.39)	-0.027 (-0.73)	-0.146*** (-4.81)	-0.035 (-0.97)
Tobin's Q	0.013*** (4.57)	0.009*** (3.66)	0.013*** (4.81)	0.009*** (3.81)
Leverage	-0.088*** (-3.75)	-0.087*** (-3.89)	-0.075*** (-3.29)	-0.077*** (-3.50)
ROA	0.399*** (8.18)	0.270*** (6.47)	0.379*** (7.99)	0.265*** (6.43)
R&D intensity	0.821*** (8.79)	0.549*** (6.09)	0.837*** (9.01)	0.565*** (6.31)
A&D intensity	1.206*** (7.89)	1.171*** (8.09)	1.177*** (7.87)	1.167*** (8.16)
Prior-year return	-0.039*** (-6.34)	-0.017*** (-4.66)	-0.038*** (-6.56)	-0.017*** (-4.88)
Blue	0.078*** (7.55)	0.064*** (6.08)	0.078*** (7.56)	0.063*** (6.11)
IO	0.031 (1.49)	-0.095*** (-3.78)	0.034 (1.63)	-0.086*** (-3.43)
Age			-0.000 (-0.48)	-0.001 (-1.50)
Tenure			0.004*** (6.01)	0.003*** (4.06)
Gender			-0.131*** (-6.95)	-0.115*** (-6.72)
Year FE	NO	YES	NO	YES
Industry FE	NO	YES	NO	YES
Adj R2	0.162	0.261	0.169	0.265
N	30,545	30,543	30,545	30,543

**Table 3. Long-horizon buyers and sellers**

This table presents the results from using three different measures to distinguish long-term buyers from long-term sellers. Column (1) presents results using the interaction term of insider investment horizon and trading strength rank in a given year (*STR\_RK*), calculated as the rank of the ratio of net purchases to total trading volume for the firm to which an insider belongs. Column (2) presents the results from using the interaction term of insider investment horizon and *Netbuyer*, which is equal to one if the net purchase of one insider is positive in a given year, or zero otherwise. Column (3) introduces the interaction term of insider investment horizon and *Netbuyer10*, which takes the value of one if the insider made a net purchase during the past 10 years, or zero otherwise. All firm- and insider-level control variables used in the baseline model are considered and are defined in Appendix A. The sample period is 1996–2015. Standard errors are clustered at the insider level, and the t-statistics are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: CSR		
	(1)	(2)	(3)
HOR	0.011 (0.65)	0.021 (1.56)	0.028** (2.07)
HOR×STR_RK	0.042 (1.32)		
STR_RK	0.018 (0.71)		
HOR×Netbuyer		0.041 (1.63)	
Netbuyer		-0.029 (-1.50)	
HOR×Netbuyer10			-0.006 (-0.23)
Netbuyer10			0.028 (1.30)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.266	0.265	0.265
N	30,543	30,543	30,543

**Table 4. Good internal corporate governance or agency problems**

Panel A shows the results of the regression to test the relation between two subcategories (CSR strengths and concerns) of overall CSR performance and insider investment horizon. Column (1) tabulates the results regarding CSR strength while column (2) presents the results of CSR concerns. Panel B shows the results of the regression to test the relation between two subcategories (material and immaterial CSR) of overall CSR performance and insider investment horizon. Column (1) tabulates the results regarding material CSR while column (2) presents immaterial CSR. The classification for material and immaterial CSR is conducted based on Sustainability Accounting Standards Board (SASB) Materiality Map for different industries. The sample period runs from 1996 to 2015. All firm- and insider-level control variables used in baseline model are included. Variables are defined in Appendix A. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

Panel A: Strengths and Concerns		
Dependent variable	Strength (1)	Concern (2)
HOR	0.001 (0.16)	-0.025*** (-2.92)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.464	0.311
N	30,543	30,543
Panel B: Material and Immaterial		
Dependent variable	Material (1)	Immaterial (2)
HOR	0.015** (2.31)	0.012 (1.37)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.172	0.246
N	30,543	30,543

**Table 5. Different Insiders**

This table reports the regression results of our baseline model to test the association between insider investment horizon and overall CSR performance with respect to different insiders from 1996 to 2015. Dependent variable is firm-level CSR performance. All firm- and insider-level control variables used in the baseline model are considered. Variables are defined in Appendix A. Column (1) reports the results of directors and Column (2) shows the results of officers. Column (3), (4) and (5) tabulate the results of CEO, chairman of board (CB) and CFO, respectively. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

	Director (1)	Manager (2)	CEO (3)	CB (4)	CFO (5)
HOR	0.043*** (2.97)	0.030* (1.85)	0.086*** (3.31)	0.064* (1.78)	0.04 (0.93)
Controls	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Adj R2	0.264	0.266	0.273	0.278	0.251
N	16,560	19,860	4,854	2,745	2,511

**Table 6. CEO Career Concern Effects**

This table presents the difference-in-difference-in-difference regression results using the CEO career concerns as exogenous shocks to insider investment horizon. The dependent variable is firm-level CSR performance. We build the sample by matching firms with CEO career concerns (treated firms) against up to 10 firms without such concerns (control firms) that belong to the same industry (Fama-French 48 industry) and have similar total assets. Observations are kept if they are within -3 to +3 years of the occurrence of career shocks. Column (1) and (2) presents the results using the standard regression approach including only CEOs and all insiders of treated and control firms, respectively. Column (3) and (4) repeat the analyses of Column (1) and (2) with a stacked regression approach. *CEO Carrershock* is a dummy taking the value of one after a CEO (firm) has suffered a CEO career shock, or zero otherwise. *Treated Firm* is an indicator equal to one for firms in which the CEO is hit by a career shock, regardless of time. All firm- and insider-level control variables used in the baseline model are considered and are defined in Appendix A. Standard errors are clustered at the insider level, and the *t*-statistics are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Standard Regression		Stacked Regression	
	CEO only	All insiders	CEO only	All insiders
	(1)	(2)	(3)	(4)
HOR×CEO Careershock	-0.537* (-1.66)	-0.264*** (-3.11)	-0.537* (-1.67)	-0.201** (-2.06)
HOR	0.263* (1.83)	0.05 (0.95)	0.285** (2.11)	0.049 (0.87)
CEO Careershock	0.346 (1.19)	0.051 (0.57)	0.409 (1.35)	0.067 (0.63)
Treated Firm	0.139 (0.74)	0.346*** (4.64)	0.101 (0.45)	0.287*** (3.50)
Controls	YES	YES	YES	YES
Year FE	YES	YES	NO	NO
Industry FE	YES	YES	NO	NO
Year × Stack FE	NO	NO	YES	YES
Industry × Stack FE	NO	NO	YES	YES
Adj R2	0.282	0.337	0.337	0.332
N	365	2,397	2,883	18,696

**Table 7. Inevitable Disclosure Doctrine Effects**

This table shows the difference-in-difference-in-difference regression results using the rejection of IDD as exogenous shocks to insider investment horizon. The sample period spans from 1996 to 2015. The dependent variable is firm-level CSR performance. Column (1) and (2) presents the results using the standard regression approach and the stacked regression approach, respectively. *IDD rejection* is equal to one after one state rejects IDD and *Rejection state* is an indicator equal to one for states rejecting IDD, irrespective of time. All firm- and insider-level control variables used in baseline model are considered and variables in the table are defined in Appendix A. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

	Standard Regression	Stacked Regression
HOR×IDD rejection	0.055** (2.36)	0.048* (1.72)
HOR	0.002 (0.10)	0.119*** (6.16)
IDD rejection	-0.008 (-0.38)	-0.029 (-1.14)
Rejection state	-0.004 (-0.30)	0.030** (2.31)
Controls	YES	YES
Year FE	YES	NO
Industry FE	YES	NO
Year × Stack FE	NO	YES
Industry× Stack FE	NO	YES
Adj R2	0.266	0.189
N	30,543	132,363



**Table 8. Cross-Sectional Analyses -- Institutional Investors**

This table shows the cross-sectional regression results based on two characteristics of institutional investors. Dependent variable is firm-level CSR performance. Column (1) tabulates the results of institutional investor turnover, which is calculated following Gasper, Massa and Matos (2005). Column (2) reports the results using institutional investor churn ratio as dependent variable, which is defined based on Yan and Zhang (2009). Column (3) shows results of socially responsible institutional (SRI) ownership proxied by UNPRI signatories' ownership. All firm- and insider-level control variables used in baseline model are considered. Variables are defined in Appendix A. Sample period is 1996–2015. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

	Dependent Variable: CSR		
	(1)	(2)	(3)
HOR	0.110** (2.29)	0.155*** (3.19)	0.002 (0.12)
HOR×Turnover	-0.443* (-1.88)		
Turnover	-0.264 (-1.29)		
HOR×Churn		-1.903*** (-2.87)	
Churn		-0.555 (-0.98)	
HOR×UNPRI			0.287*** (3.05)
UNPRI			-0.127 (-1.28)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.267	0.268	0.266
N	30,543	30,543	30,543

**Table 9. Cross-Sectional Analyses -- Compensation Contracts**

This table shows the cross-sectional regression results with respect to two characteristics of compensation contracts. Dependent variable is firm-level CSR performance. Column (1) tabulates the results regarding Vega, which is calculated following Coles, Daniel and Naveen (2006). Column (2) shows the results of pay duration, which is defined based on Gopalan et al, (2014). The sample period for Vega results is 1996 to 2015 while for pay duration results is 2006 to 2015. All firm- and insider-level control variables used in baseline model are considered. Variables are defined in Appendix A. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

	Dependent Variable: CSR	
	(1)	(2)
HOR	0.032 (1.47)	-0.087* (-1.71)
HOR×Vega	0.313*** (2.83)	
Vega	-0.172 (-1.65)	
HOR×Pay duration		0.010*** (3.40)
Pay duration		-0.006** (-2.44)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.251	0.312
N	12,439	6,510

**Table 10. Real Effects — TRI Toxic Releases**

This table shows the regression results regarding the real effects of insider investment horizon on future TRI toxic releases. The sample spans from 1996 to 2015. Panel A reports the results of total toxic release. *Total release* is calculated as natural logarithm of one plus the total amount of toxic release under TRI program. The results based on onsite toxic release are presented in Panel B. *Onsite release* is defined as natural logarithm of one plus the amount of onsite toxic release under TRI program. Panel C tabulates the results of offsite toxic release and *Offsite release* is calculated as natural logarithm of one plus the amount of offsite toxic release under TRI program. All firm- and insider-level control variables used in baseline model are considered. Variables are defined in Appendix A. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

Panel A: Total Toxic Release			
Dependent Variable	Total release(t+1)	Total release(t+2)	Total release(t+3)
	(1)	(2)	(3)
HOR	-0.610**	-0.553**	-0.521**
	(-2.49)	(-2.27)	(-2.11)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.420	0.423	0.433
N	6,182	6,058	5,932
Panel B: Onsite Toxic Release			
Dependent Variable	Onsite release(t+1)	Onsite release(t+2)	Onsite release(t+3)
	(1)	(2)	(3)
HOR	-0.792***	-0.687**	-0.624**
	(-2.89)	(-2.48)	(-2.25)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.406	0.409	0.419
N	6,182	6,058	5,932
Panel C: Offsite Toxic Release			
Dependent Variable	Offsite release(t+1)	Offsite release(t+2)	Offsite release(t+3)
	(1)	(2)	(3)
HOR	0.098	0.106	-0.01
	(0.30)	(0.32)	(-0.03)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.367	0.355	0.344
N	6,182	6,058	5,932

**Table 11. Real Effects — CSR Compliance Violations**

This table shows the regression results regarding the real effects of insider investment horizon on future CSR violations from 2000 to 2015. In Panel A, the dependent variable is the *Violation* indicator, which is equal to one if one firm has at least one CSR violation recorded in Violation Tracker database, and zero otherwise. A probit specification is adopted to test the relation between insider investment horizon and *Violation* indicator. In Panel B, the dependent variable is total amount of related CSR violation penalties collected by Violation Tracker. We estimate a linear specification using the sample including firms with non-missing amount of CSR penalties. All firm- and insider-level control variables used in baseline model are considered. Variables are defined in Appendix A. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

Panel A: CSR Violation Indicator			
Dependent Variable	Violation(t+1)	Violation(t+2)	Violation(t+3)
	(1)	(2)	(3)
HOR	-0.104** (-1.99)	-0.073 (-1.42)	-0.061 (-1.21)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Pseudo R2	0.321	0.315	0.321
N	30,371	30,384	30,318
Panel B: CSR Violation Penalties			
Dependent Variable	Penalties(t+1)	Penalties(t+2)	Penalties(t+3)
	(1)	(2)	(3)
HOR	-3.179* (-1.87)	-1.066 (-0.79)	-1.650 (-0.77)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.406	0.409	0.419
N	6,374	6,462	6,608

**Table 12. Real Effects — Employee Satisfaction**

This table shows the regression results regarding the real effects of insider investment horizon on future employee satisfaction. Dependent variable is *Best 100*, an indicator that takes the value one if one firm is listed on “Best 100 Companies to Work for in America” in a given year, and zero otherwise. We estimate a probit specification to examine the relation between insider investment horizon and the *Best 100* indicator. All firm- and insider-level control variables used in baseline model are considered. Variables are defined in Appendix A. Sample period is 1996–2015. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

Dependent Variable	Best100(t+1)	Best100(t+2)	Best100(t+3)
	(1)	(2)	(3)
HOR	0.429*** (3.69)	0.392*** (3.32)	0.199* (1.73)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Pseudo R2	0.413	0.404	0.397
N	25,614	25,407	25,019

**Table 13. Real Effects — RepRisk index and ESG incidents**

This table shows the regression results regarding the real effects of insider investment horizon on future RepRisk index (RRI) and ESG incidents from 2007 to 2015. In Panel A, dependent variable is *ESG incidents*, defined as the annual number of ESG incidents detected by RepRisk. In panel B, dependent variable is *RRI*, calculated as the average RepRisk index within a year for each firm. All firm- and insider-level control variables used in the baseline model are considered. Variables are defined in Appendix A. Standard errors are clustered at the insider-level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote statistical significance at 1%, 5%, and 10% level, respectively.

Panel A: ESG Incidents			
Dependent Variable	ESG incidents(t+1)	ESG incidents(t+2)	ESG incidents(t+3)
	(1)	(2)	(3)
HOR	-1.419** (-2.51)	-1.784*** (-3.03)	-1.845*** (-3.25)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Pseudo R2	0.296	0.313	0.314
N	15,880	17,365	18,707
Panel B: RepRisk Index			
Dependent Variable	RRI(t+1)	RRI(t+2)	RRI(t+3)
	(1)	(2)	(3)
HOR	-0.804** (-2.38)	-0.986*** (-3.09)	-0.864*** (-2.83)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.544	0.552	0.559
N	15,880	17,365	18,707