Corporate social responsibility and insider horizon

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Abstract: Insiders, including directors and managers, are instrumental in establishing corporate strategy and steering a firm's direction. Our findings 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[1] 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, 2021). 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[2]. 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 insiders' horizon 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 their 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.[3] Because CSR usually pays off over the long run, myopic insiders are likely to 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.[4] Compared to the conventional insider horizon measures based on insider incentive pay (e.g., Gopalan et al., 2014), ours appears better able to capture insiders' willingness to pursue long-term value, as insiders can decide their own trades within legal guidelines while their compensation

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[1] 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, 2020).

[2] 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.

[3] See, for example, Edmans, Fang, and Lewellen, 2017; Kraft, Vashishtha, and Venkatachalam, 2018; Ladika and Sautner, 2020.

[4] Edmans, Gosling, and Jenter (2021) show that managers' intrinsic motivations may be stronger than extrinsic motivations stemming from their incentive pays.

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.[5] 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 next classify insiders into persistent buyers and persistent sellers and hypothesize that persistent buyers are more likely to hold a strongly positive expectation of their firms, whereas the trading behavior of persistent sellers may be driven by a large amount of vesting equity[6] and a long-run negative expectation of firms. We show that the positive effects of insider investment horizon on CSR performance are concentrated on long-term buyers, who may exhibit a long-term positive view of their firms by "voting with their feet."

We then disentangle whether the positive effects of insider investment horizon on CSR performance stem from insiders' agency problems to entrench themselves or from good internal corporate governance, the latter of which can benefit shareholders. To this end, we first demonstrate that the positive effects of long-horizon insiders on CSR are driven primarily by CSR concerns, to

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[5] Akbas, Jiang, and Koch (2020) document that insiders with shorter investment horizons engage more in myopic activities such as earnings management.

[6] Edmans, Fang and Lewellen (2017) document that increased vesting equity leads to a decrease in research and development expenses (R&D) and long-term investments, which is the manifestation of managerial short-termism.

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). The evidence supports the view that good internal corporate governance motivates insiders to engage in CSR, which can potentially benefit shareholders. To check robustness, we conduct a variety of tests by considering different types of insiders separately, using alternative measures for insider investment horizon and CSR performance, and splitting the sample. We find the main results are qualitatively similar.

Despite various precautions, we may be unable to identify the 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 horizon. First, we focus on reductions in managerial career horizon triggered by exogenous events, as shown by Aktas, Boone, Croci, and Signori (2021). Insiders with a shorter career horizon are more likely to engage in myopic activities, such as reducing CSR investments. Having adopted a difference-in-difference approach, we find that CSR performance deteriorates in response to those events that reduce managerial career horizon. Second, we facilitate the causal interpretation relying on the staggered rejection of the inevitable disclosure doctrine (IDD). In the case of such rejection, insiders may have more outside opportunities and less pressure to achieve short-term targets. Thus, they may take long-run views and pursue more long-term value. Indeed, we find that after the rejection of the IDD, a firm's CSR performance tends to boost.

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, which supports the view that insiders' long-term perspectives contribute to alleviating climate change. 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. 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, especially factors related to horizon issues. Prior studies investigate whether horizon influences CSR performance, paying particular attention to the horizon of institutional investors, and demonstrate that longer institutional investor horizon leads to better firm-level CSR performance (e.g., Kim et al., 2019; Glossner, 2019; Krueger, Sautner, and Starks, 2020; Starks, Venkat, and Zhu, 2021). However, relatively little is known about whether and how other key stakeholders' horizon affects CSR. Our paper fills this gap by establishing a positive link between insider investment horizon and CSR, which reinforces the argument that a long-term perspective is beneficial to CSR. Our study also complements Flammer and Bansal (2017), who document that the passage of shareholder proposals related to long-term

executive compensation improves CSR performance, by providing a new perspective to measure insiders' willingness to pursue long-term value based on insiders' trading behavior rather than their incentives.

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.[7] Notably, Edmans, Fang, and Huang (2021) 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 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.[8] 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 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

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[7] 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).

[8] 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.

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 MSCI ESG KLD database (KLD), which has a long history of available ESG rating data[9] and has been extensively adopted by researchers exploring the determinants of firm-level CSR performance. 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 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. 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.

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[9] 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.

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).[10] 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:

$$HOR_{i,j,t} = \left| \frac{\sum_{T-10}^{T-1} IOF_{i,j,y}}{N} \right|$$

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 an insider purchases (sells) during a given year. N is the number of years an insider traded over the ten years before 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).[11]

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*

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[10] 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.
[11] 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.

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 ager (*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.[12] The summary statistics of all variables used for primary results are reported in Table 1. 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.[13] The negative trading strength (*STR*) reveals insiders sell more than purchase.[14] 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.

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[12] 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.

[13] 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.

[14] 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.

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:

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

Where i indexes insiders, j indexes firms, and t indexes years. The dependent variable, $CSR_{j,t}$, is the CSR rating score for firm j in year t, 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 ($\delta Industry_k$) and year-fixed effects ($\theta Year_t$)[15] in the baseline regression model.

As shown in Column (1) of Table 2, the coefficient of *HOR*, 0.038 with a *t*-statistic of 3.16, 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 5% level (*t*-statistic of 2.19). Evidently, these results suggest a positive relation between insider investment horizon and firm-level CSR performance.

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[15] 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.

Next, we distinguish between persistent buyers and sellers by introducing the interaction of *HOR* and *STR_rank*. The idea is that long-horizon buyers tend to be more engaged in CSR activities and promote greater CSR performance compared to long-horizon sellers. First, persistent buyers may hold strongly positive views relative to persistent sellers regarding their firms' prospects as they often support firms by "voting with their feet." Second, long-term sellers likely have a variety of motives for their persistent sales behavior such as amount of vesting equity and long-term negative perspectives regarding the future of their firms. Collectively, we posit that long-horizon buyers may be more willing to engage in CSR activities and promote CSR performance compared to long-horizon sellers. In other words, the positive effects of insider investment horizon on CSR should be primarily driven by long-horizon buyers.

Consistent with this, in Column (2) we find the coefficient of the interaction term, *HOR × STR_rank*, is positive and significant at the 1% level, while the loading on *HOR* becomes insignificant. This result holds after adding three insider-level controls. Column (4) shows the corresponding coefficient of the interaction term is 0.062 with a *t*-statistic of 4.25. Those findings suggest that the positive effects of insider investment horizon on CSR performance are concentrated on long-term buyers.

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" (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 significantly positive. The negative 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 (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.

An alternative explanation for the positive relation between CSR performance and insider horizon may be the deep link between insiders' human capital and 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 unreported analysis.

Overall, our baseline results suggest that insider investment horizon has positive effects on firm-level CSR performance, which is consistent with the view that CSR requires long-term commitment. We also show that this positive relation is primarily driven by persistent buyers who may be more confident about their firms' prospects and thus are more likely to pursue long-term payoffs.

3.2. Good internal corporate governance or agency problems?

Our explanation for the positive relation between insider investment horizon and CSR performance is that long-horizon insiders tend to pursue long-term value. Therefore, they promote CSR as it is more likely to pay off over the long run. On the one hand, the positive effects of insider investment horizon on CSR performance can be interpreted as good internal corporate governance. On the other hand, prior studies show the efforts that insiders make to improve CSR performance may stem from agency problems (e.g., Krueger, 2015; Masulis and Reza, 2015; Cheng, Hong, and Shue, 2020). In our context, agency problems refer to insiders' propaganda detailing their efforts to engage in CSR activities and promote CSR performance but do not benefit shareholders ultimately. Put differently, insiders may spend on CSR to build a socially friendly image that is likely to entrench their positions. To discriminate between good internal corporate governance and agency problems, we conduct two sets of tests.

3.2.1. Strengths and concerns. First, 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, the positive relation between CSR performance and insider investment horizon may be attributed to a lower level of CSR concerns if insiders aim to create value for shareholders. Conversely, the positive relation may be driven by insiders' agency motivations if it mainly stems from a higher level of CSR strengths.

[Insert Table 3 here]

We repeat the exercise but replace the dependent variables in the baseline model with CSR strengths and concerns. Table 3 tabulate 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 (3) shows the loading on *HOR* is -0.025, with a *t*-statistic of -2.92, revealing a significantly negative relation between insider investment horizon and CSR concerns. Thus, we confirm 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.

Moreover, when we distinguish long-term buyers from sellers, we find that the coefficient of the interaction term, *HOR × STR_rank*, is positive and significant at the 1% level, while the coefficient of *HOR* becomes significantly negative (*t*-statistic of -2.41) in Column (2), suggesting that only long-term buyers care about CSR strengths. In contrast, we do not find the negative relation between insider investment horizon and CSR concerns is concentrated on a specific group of insiders (i.e., long-term buyers or sellers) because the coefficient of *HOR* is significantly negative (*t*-statistic of -2.84) based on Column (3), while loading on the interaction term is not significant, as shown in Column (4). This indicates that while all long-horizon insiders care about CSR concerns, only long-term buyers focus on CSR strengths, suggesting that the primary focus of long-horizon insiders is CSR concerns. Taken together, these findings support the good corporate governance view.

3.2.2. Material and immaterial issues. Next, we determine whether long-horizon insiders improve CSR performance and benefit shareholders by examining whether the insider investment horizon is related to 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.[16] 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.[17] 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 an CSR indicator is material or immaterial for firms within different industries, we hand-map firm-level CSR indictors from the KLD database with the SASB sector-specific guidelines. [18] 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.

We repeat the baseline model, replacing the dependent variable with the financially material and immaterial CSR score. Table 4 presents the results. As shown in Column (1), the coefficient of *HOR* is positive and significant at the 5% level, suggesting that insider investment horizon is positively related to material CSR performance. In comparison, Column (3) shows an insignificant loading on *HOR*, with a *t*-statistic of 1.37, indicating long-horizon insiders do not have significant

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[16] For more information, see https://materiality.sasb.org/

[17] 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.

[18] 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.

effects on immaterial CSR performance.

[Insert Table 4 here]

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.

Furthermore, we find that long-horizon insiders do not harm shareholder value when investing in CSR by exploring whether and how long-horizon insiders have negative impacts on future firm performance. Specifically, we examine the relation between insider horizon and Tobin's q, asset growth and return on assets (ROA) in future one and two years. These results are reported in Table IA1. As shown in Panel A, we find a positive relation between insider horizon and both future one- and two-year Tobin's q, indicating that long-horizon insiders can improve future firm valuation. Based on Panel B, we find that insider horizon is negatively associated with future 1- and 2-year asset growth, suggesting that long-horizon insiders are unlikely to engage in empire building at the expense of shareholder value. Panel C shows that insider horizon is positively related to future two-year ROA, though it does not significantly influence future 1-year ROA as it may take time. Our findings regarding insider horizon and future performance indicate that long-horizon insiders do not harm shareholder value when engaging in CSR activities, reconciling with the "pie-growing mentality" of Edmans (2021) that firms can seek for profits and valuation through creating value for society over the long run.

Taken together, our tests regarding different CSR dimensions and future firm performance suggest that long-horizon insiders also care about and benefit shareholders when engaging in CSR activities. These findings support the view that the positive effects of insider horizon on CSR performance are more likely to be driven by good internal corporate governance rather than insiders' selfish agency motives.

3.3. Different types of insiders

Given that insiders in different positions may have different attitudes towards CSR, we examine

whether the investment horizon of different insiders affects CSR performance.

We repeat the baseline model but consider the results for different types of insiders separately. The results are shown in Table 5. We first consider directors and officers, who account for over 85% of our sample. Due to agency problems and their limited tenure, managers may have less desire to pursue long-term value compared to directors, who represent shareholders. Benabou and Tirole (2010) demonstrate that shareholders need to monitor management to correct their short-term biases that harm the long-term value of CSR. As such, we expect the positive relation between insider investment horizon and CSR performance is stronger for directors relative to managers. Consistent with this expectation, we find that the loading on *HOR* is 0.043 and significant at the 1% level for directors as evidenced in Column (1), while the loading is 0.030 and significant at the 10% level for officers as shown in Column (3). This suggests long-horizon directors have stronger effects on CSR performance compared to long-horizon officers both in magnitude and statistical significance.

[Insert Table 5 here]

Next, we individually test the relation between CSR performance and investment horizon of specific insiders who may make critical corporate decisions. Column (5) shows that long-horizon CEOs have much stronger effects on CSR performance compared to other insiders. The coefficient 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 (7) reveals the loading on *HOR* is 0.064, with a *t*-statistic of 1.78, indicating the chairman's investment horizon has significantly positive but weaker effects on CSR performance compared to CEOs. As evidenced in Column (9), long-term CFOs have no effect on CSR performance, which is unsurprising as CSR is beyond the scope of a CFOs' responsibilities.

3.4. Robustness tests

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

Alterative measures of insider horizon. First, we consider alternative measures of insider

investment horizon, including *7-year HOR*, *5-year HOR*, and *LH*. Compared with the baseline 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 6 presents the results. We find the results of the robustness tests do not alter 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., investment style, liquidity needs, vesting policy of restricted equity) in the short term. The signs of the interaction terms (*HOR×STR_rank*) are all consistent with the baseline results, indicating long-term buyers are more willing to promote CSR performance compared to long-term sellers.

[Insert Table 6 here]

In addition to trading strength rank in current year (*STR_rank*), we construct two alternative measures to distinguish between long-term buyers and sellers. The first measure is the trading strength rank (*STR_rank10*), calculated based on one insider's trading behavior over the past ten years. We aggregate the total net purchase of insiders and total trading volume of their firms' stocks over the past ten years. We then calculate the ratio of aggregated net purchase and trading volume and, based on the ratio, rank insiders into quintiles. The rank for each insider is then divided by four to create a range from zero to one. Another measure is the dummy (*Netbuyer10*), which takes the value of one if the insider has a positive net purchase over the past ten years and zero otherwise. Next, we add the interaction term of insider investment horizon and these two alternative measures into our baseline model and report the results in Table IA2. The positive and significant coefficients of the interaction term of these two measures confirm that long-term buyers tend to drive the positive relation between insider investment horizon and CSR performance.

Alternative CSR measures. We perform various tests to check whether alternative 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,

17

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) and (2) in Panel B of Table 6 tabulate the results. Though the coefficient of *HOR* is positive, it is not statistically significant (*t*-statistic of 1.60). However, in Column (2), we find that long-term buyers have positive effects on CSR performance, as loading on the interaction term (*HOR×STR_rank*) is positive and significant at the 1% level. The statistical insignificance of the loading on *HOR* 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 (3) and (4) in Panel B of Table 6 present 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 (5) and (6) in Panel B of Table 6 show the results remain unchanged when using the rank of CSR performance as the dependent variable.

Firm-level analysis. We construct firm-level measures of insider investment horizon to capture the willingness of insiders to pursue long-term value, in addition to our baseline results using an insider-level measure. According to Narayanan (1985), insiders tend to focus on short-term performance when they possess private information. In other words, taking advantage of private information may indicate insiders are less likely to pursue long-term value. To check whether one insider takes advantage of private information, we exploit the variation of insiders' trading behavior. First, we aggregate the insider investment horizon of Akbas et al. (2020) into a firm-level measure (*Frac_LH*) by calculating the ratio of the number of insiders with an insider investment horizon *(HOR)* equaling one on the number of all insiders for a given firm in the recent year. As shown in Column (1) of Table IA3, the fraction of long-horizon insiders (*Frac_LH*) is still positively related to CSR performance. We also construct the fraction of opportunistic insiders in each firm following Ali and Hirshleifer (2017), who document that a higher fraction of opportunistic insiders leads to a higher level of financial misconduct. We define opportunistic

insiders as the type of insiders who trade profitably before the 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 based on Column (2) of Table IA3, suggesting that firms with opportunistic insiders, who may be less willing to pursue long-term value, tend to have worse CSR performance. Last, we analyze the timing of insider trading and define those 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 the trades of routine insiders include less information content compared to insiders who do not trade with persistent timing. We then calculate the fraction of routine insiders in each firm. We argue that routine insiders are the type of insiders who are less likely to take advantage of private information and thus are more likely to pursue long-term value. This indicates the fraction of routine insiders is positively related to CSR performance as shown in Column (3) of Table IA3.

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 tabulates the results of this subsample analysis. Columns (1) and (2) show the results from the period have no significance. In contrast, we find our baseline results remain similar in the latter period based on Columns (3) and (4). 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 insider horizon.

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.

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

$$CSR_{j,t} = \beta_0 + \beta_1 HOR_{i,j,t} \times Careershock_{j,t} + \beta_2 HOR_{i,j,t} + \beta_3 Careershock_{j,t} + \gamma_1 X_{j,t} + \gamma_2 Y_{i,j,t}$$
$$+ \delta Industry_k + \theta Year_t + \varepsilon_{i,j,t}, \tag{2}$$

where *Careershock* indicates the above-mentioned events that cause a reduction in managerial career horizon, taking the value of one if the firm is affected by these events and zero otherwise. To build the sample for the difference-in-difference regression, 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[19].

The results are shown in Table 7. The key variable of interest is the interaction term of *Careershock* and *HOR*. The coefficient of the interaction term *(HOR×Careershock)* measures how insider horizon affects CSR performance in response to events that reduce managerial career horizon. As CSR performance may deteriorate due to a shorter insider horizon, we expect the coefficient of the interaction term to be negative. Indeed, we find the coefficient of the interaction term between *HOR* and *Personalshock* to be negative and significant, as shown in Column (1), when only considering CEOs of treated firms and their matched control firms. This finding suggests a worse CSR performance after a negative shock to CEO horizon. We also consider all insiders in this matched sample. The idea is that the reductions in CEO career horizon may also temporarily reduce the horizon of other insiders. Based on Atkas et al. (2021), firms affected by CEO career horizon reduction tend to have a higher level of tournament for the future CEO position within other top managers, as affected CEOs may delegate more tasks to these managers. In this case, these managers may try to boost short-term performance to show their ability, which indicates that they may temporarily have a shorter horizon. As shown in Column (2) of Table 7, we include all insiders and find a negative and significant coefficient for the loading of the interaction term between *HOR* and *Firmshock*, suggesting that firms hit by reductions in CEO career horizon exhibit a deteriorated CSR performance. Comparing the coefficients of the interaction term in Column (1) and (2) of Table 7, the coefficient becomes stronger both in magnitude and statistical significance; this may corroborate the argument that career horizon reductions may not only influence the horizon of CEOs but also other insiders.

[Insert Table 7 here]

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

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[19] The detailed event data including 49 events are provided in the Appendix B of Atkas et al. (2021).

performance.

4.2. The effects of Inevitable Disclosure Doctrine

We employ the staggered rejection and adoption of the inevitable disclosure doctrine (IDD) by multiple states as another exogenous shocks to insider horizon. The aim of the IDD is 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. After the rejection of the IDD, employees have more outside opportunities. Under less pressure, insiders tend to take more long-run view and pursue more long-term value. By contrast, the adoption of IDD should have perfectly opposite effects on insider horizon, that is, the adoption of IDD may cause a shorter insider horizon. As such, our expectation is that the insider horizon should be longer (shorter) after states reject (adopt) the IDD and this longer (shorter) insider horizon can lead to better (worse) CSR performance.

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

$$CSR_{j,t} = \beta_0 + \beta_1 HOR_{i,j,t} \times IDD_{s,t} + \beta_2 HOR_{i,j,t} + \beta_3 IDD_{s,t} + \gamma_1 X_{j,t} + \gamma_2 Y_{i,j,t}$$
$$+ \delta Industry_k + \theta Year_t + \varepsilon_{i,j,t}, \tag{3}$$

Compared to the baseline regression model, we add the indicators to identify whether state s has rejected or adopted the IDD (*IDD Rejection* or *IDD adoption*) and their interaction terms. *IDD Rejection* takes the value of one if the state in which the firm is headquartered has rejected the IDD before the year and zero otherwise. *IDD Adoption* is equal to one if the headquarter state of one firm has adopted the IDD before the year and zero otherwise.

The idea is that insider horizon may lengthen (shorten) after the IDD is rejected(adopted), and this longer(shorter) horizon may lead to better (worse) CSR performance. This implies that in this difference-in-difference setting, the coefficient of interest is that of the interaction term, which captures the change in firm-level CSR performance to insider horizon in response to the rejection or adoption of the IDD. Thus, if long-term insiders causally promote CSR performance, we expect the loading on the interaction term between *HOR* and *IDD Rejection* (*Adoption*) is significant and positive (negative).

[Insert Table 8 here]

In line with our expectation, Panel A of Table 8 shows that the loading on the interaction term between *HOR* and *IDD Rejection* is 0.055, with a *t*-statistic of 2.37, suggesting that insiders improve CSR performance in response to positive shocks to their horizon. This suggests the positive association between CSR performance and insider horizon is causal. The results based on the adoption of IDD are shown in Panel B of Table 8. The coefficient of the interaction term between *HOR* and *IDD Adoption* is negative and significant at the 1% level, which is perfectly opposite to results based on the rejection of IDD. This suggests that CSR performance exhibits a decrease in response to a negative shock to insider horizon, and thus facilitates a causal interpretation for the relation between insider horizon and CSR performance.[20]

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) when factors that encourage (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

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[20] Although both the difference-in-difference analyses of IDD rejection and adoption support 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) show that firms improve their CSR after the rejection of the IDD in order 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. This indicates another potential channel through which the rejection of the IDD can improve a firm's CSR strategies.

insider investment horizon and CSR performance when a firm's institutional investors have a longer (shorter) investment horizon.

Two measures are employed for institutional investor 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 a shorter institutional investors' investment horizon.

As shown in Table 9, 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×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) of Table 9, 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×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 9 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

24

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.[21] 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) of Table 9. The loading on the interaction term (*HOR×UNPRI*) is positive and significant at the 1% level, confirming that UNPRI signatories' ownership enhances the positive relation between insider investment horizon and CSR performance.

5.2. Compensation contracts

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

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[21] For more information, see https://www.unpri.org/pri/what-are-the-principles-for-responsible-investment

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 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.[22]

[Insert Table 10 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 10 tabulates the results. The variable of interest is the interaction term. Consistent with our prediction, we find the coefficient of the interaction term (*HOR×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.

We then repeat the 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×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.

5.3. Takeover pressure

Finally, we examine whether our baseline results change according to the different levels of antitakeover pressure since one major source of managerial short-termism is takeover pressure. In the model of Stein (1998), as shareholders may not evaluate long-term investment projects due to information asymmetry, firms investing heavily in long-term projects tend to be undervalued. The

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[22] 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.

undervaluation in turn increases the likelihood of hostile takeover at low cost. To protect against such hostile takeovers, insiders tend to invest less in long-term projects though sacrificing long-term value. Rather, they invest more in those short-term projects for certain returns. The intuition of Stein's model can naturally apply to our setting, that is, insiders may become more willing to pursue long-term value with less takeover pressure. The passage of state-level antitakeover laws can reduce takeover pressure for firms incorporated in such states. Thus, we expect the enactment of antitakeover laws may enhance the positive relation between insider horizon and CSR performance.

To examine the effects of antitakeover laws, we focus on the enactment of business combination (BC) law, which is regarded as one of the most powerful antitakeover laws. Following the recommendations of Karpoff and Wittry (2018), we control for other major types of antitakeover laws[23]. We repeat the baseline model but add the interaction term of insider investment horizon (*HOR*) and the indicator for the enactment of BC law (*BC law*) together with the *BC law*.

[Insert Table 11 here]

Column (1) of Table 11 reports the results. The coefficient of interest is that of the interaction term. We find the coefficient of the interaction term between *HOR* and *BC* is positive and significant, with a *t*-statistic of 2.06, indicating that the positive relation between insider horizon and CSR performance is stronger under less takeover pressure. Next, we add a set of control variables for other major second-generation antitakeover laws, including control share acquisition laws (*CS*), fair price laws (*FP*), directors' duties laws (*DD*) and poison pill laws (*PP*). The adoption dates of these antitakeover laws are extracted from Karpoff and Wittry (2018). Based on Column (2) of Table 11, the coefficient of the interaction term remains positive and significant at the 5% level, indicating a stronger baseline result driven by the enactment of business combination irrespective of other existing antitakeover laws.

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[23] There are first-generation and second-generation antitakeover laws. States could adopt multiple antitakeover laws at the same time. First-generation antitakeover laws were adopted by 38 U.S states from 1968 to 1981 but were repealed gradually after 1982. Instead, states adopted second-generation antitakeover laws since 1982. There are five most common types of second-generation antitakeover laws: control share acquisition laws, business combination laws, fair price laws, directors' duties laws and poison pill laws.

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 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 of improving CSR.[24] 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.[25] Nevertheless, the TRI database only covers 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 estimate the baseline model by replacing the dependent variable with toxic releases calculated as the natural logarithm of one plus one firm's total quantity of toxic chemical releases in pounds (*Total releases*). The results are reported in Column (1) of Table 12. As shown in Column (1), the coefficient of *HOR* is negative and significant at the 5% level, suggesting a negative relation between insider investment horizon and a firm's total toxic releases.

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[24] 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

[25] In general, the TRI database includes three main types of chemicals that may cause 1) cancer or other chronic 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.

[Insert Table 12 here]

Next, we divide the total releases into on-site releases and off-site releases and examine the impact of insider investment horizon separately. We report corresponding results in Columns (2) and (3), respectively. As shown in Column (2), firms with long-horizon insiders exhibit a lower level of on-site releases as the loading of *HOR* is negative with a *t*-statistic of -2.89. However, Column (3) reveals no significant relation between insider investment horizon and 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.

6.2. Compliance violations

Next, we investigate whether firms with long-term insiders are less likely to commit compliance violations and receive fewer penalties from these 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[26] 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 13 here]

The dependent variable in the baseline model is replaced with the violation indicator (*CSR violation indicator*) and the dollar amount of violation penalties (*CSR violation penalties*). If a firm

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[26] 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, please see https://www.goodjobsfirst.org/violation-tracker-data-sources.

has committed one or more CSR compliance violations in a year, the violation indicator takes the value of one and zero otherwise. The dollar amount of violation penalties denotes the total amount of CSR violations penalties (in millions) for each firm in a year. We tabulate the results in Table 13. As shown in Column (1), firms with long-horizon insiders are less likely to have CSR violations recorded in the Violation Tracker database, because the loading on *HOR* is negative with a *t*-statistic of -1.99 when estimating a probit specification. In Column (2), 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 insider investment horizon is negatively related to CSR violation penalties as the loading on *HOR* is negative with a *t*-statistic of -1.87.

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.[27] The dummy variable (*Best 100 indicator*) takes the value of one if the firm is on the list in a given year and zero otherwise.

[Insert Table 14 here]

The results are presented in Table 14. In Column (1), we estimate a probit specification based on the baseline model, replacing the dependent variable with *Best 100 indicator*. We find the coefficient of *HOR* is positive and significant at the 1% level, indicating firms with long-term insiders are more likely to be included in the "Best 100." Similarly, we show that firms are more likely to be listed when the investment horizon of their insiders is longer, based on a logit model

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[27] We appreciate Alex Edmans for sharing the "100 Best Companies to Work for in America" list on https://alexedmans.com/data/.

specification as shown in Column (2).

6.4. RepRisk incidents and index

Finally, we explore whether insider investment horizon significantly 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 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 to proxy for ESG performance. The first measure is the number of ESG incidents, which can be 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 the number of ESG incidents. The index quantifies a firm's exposure to ESG issues. Both measures are reported on a monthly basis. We count the total number of ESG incidents and calculate the annual average RRI, in order to align with our yearly insider horizon measure.

We regress the number of ESG incidents and RRI on the key variable of interest and the insider investment horizon with the various control variables used in our baseline regression. We report the results in Table 15. In Column (1), the coefficient of *HOR* is negative with a *t*-statistic of -2.51, suggesting that firms with long-horizon insiders tend to have fewer ESG incidents. The coefficient of *HOR* is negative and significant at the 5% level in Column (2), indicating that firms with long-horizon insiders tend to have a lower level of risk exposure to ESG issues.

[Insert Table 15 here]

7. Conclusion

It usually takes time and persistence for CSR to create value for firms. Thus, commitment to CSR requires 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. After distinguishing between long-term buyers and sellers, we show that the positive effects of insider investment horizon are concentrated on long-term buyers. Furthermore, we find that good internal corporate governance is likely to drive the documented positive relation between insider investment horizon and CSR performance.

To support the 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 approach, we can support a causal interpretation for the positive relation between insider investment horizon and CSR performance.

Next, we confirm 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 insight 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
CSR variables	
CSR	Strengths minus Concerns (Source: MSCI ESG KLD).
Strengths	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: MSCI ESG KLD).
Concerns	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: MSCI ESG KLD).
Material	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: MSCI ESG KLD).
Immaterial	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: MSCI ESG KLD).
Raw	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: MSCI ESG KLD).
Non-zero	A dummy takes the value of one if the CSR measure is not equal to zero and zero otherwise(Source: MSCI ESG KLD).
Rank	Firms are sorted into deciles based on CSR performance measure each year (Source: MSCI ESG KLD).
Other firm-level variables	
Size	Natural logarithm of total assets (AT) (Source: Compustat).
Cash ratio	Cash holdings plus short-term investments (CHE) scaled by total assets (AT) (Source: Compustat).

Capex ratio	The ratio of capital expenditures (CAPX) over total assets (AT) (Source: Compustat).
Tangibility	The net property, plant and equipment (PPENT) divided by total assets (AT) (Source: Compustat).
Tobin's q	The ratio of total assets (AT) plus market value (CSHO*PRCC_F) minus book equity (CEQ+TXDB) over total assets (AT) (Source: Compustat).
Leverage	The sum of long-term debt (DLTT) and current debt (DLC) deflated by total assets (AT) (Source: Compustat).
ROA	The ratio of operating income before depreciation (OIBDP) over total assets (AT) (Source: Compustat).
R&D intensity	The ratio of research and development expenses (XRD) over total assets (AT). We Assign zeros to missing R&D values. (Source: Compustat).
A&D intensity	The ratio of advertising expenditures (XAD) over total assets (AT). Missing values of advertising expenses are assigned zeros. (Source: Compustat).
Blue	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).
Prior-year return	Annual stock return over the past twelve months (Source: CRSP)
IO	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).
BC law	BC is an indicator for the state adoption of business combination (BC) law. It is equal to one if the BC law is enacted in the firm's incorporation state in a given year and zero otherwise (Source: Karpoff and Wittry (2018)).
CS law	CS is an indicator for the state adoption of control share acquisition (CS) law. It is equal to one if the CS law is enacted in the firm's incorporation state in a given year and zero otherwise (Source: Karpoff and Wittry, 2018).
FP law	FP is an indicator for the state adoption of fair price (FP) law. It is equal to one if the FP law is enacted in

	the firm's incorporation state in a given year and zero otherwise (Source: Karpoff and Wittry, 2018).
DD law	DD is an indicator for the state adoption of directors' duties (DD) law. It is equal to one if the DD law is enacted in the firm's incorporation state in a given year and zero otherwise (Source: Karpoff and Wittry, 2018).
PP law	PP is an indicator for the state adoption of poison pill (PP) law. It is equal to one if the PP law is enacted in the firm's incorporation state in a given year and zero otherwise (Source: Karpoff and Wittry, 2018).
IDD Rejection	A dummy is equal to one if the state that one firm is headquartered rejected the IDD before year t (Source: Na, 2020).
IDD Adoption	A dummy is equal to one during the period that IDD takes effect in the state that one firm is headquartered (Source: Na, 2020).
Turnover	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).
Churn	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).
UNPRI	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).
Total releases	The natural logarithm of one plus the amount of total releases of toxic chemicals in pounds under TRI program (Source: EPA TRI Toxic Release database).
On-site releases	The natural logarithm of one plus the amount of on-site releases of toxic chemical in pounds under TRI program (Source: EPA TRI Toxic Release database).

Off-site releases	The natural logarithm of one plus the amount of off-site releases of toxic chemical in pounds under TRI program (Source: EPA TRI Toxic Release database).
CSR violation indicator	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).
CSR violation penalties	The amount of total CSR violation penalties in millions for a firm-year (Source: Violation Tracker database).
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_rank	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: $$HOR_{i,j,t} = \left| \frac{\sum_{T-10}^{T-1} IOF_{i,j,y}}{N} \right|$$ 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-10 to year T-1. 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 Reuters Insider and CRSP).
Age	The age of one insider in each year (Source: BoardEx).
Tenure	The number of years that an insider works for a given firm (Source: BoardEx).
Gender	A dummy is equal to 1 if the insider is male and 0 if female (Source: BoardEx).
Officer	A dummy is equal to 1 if one insider takes the position of officer as classified by Thomson Reuters Insider

	database and 0 otherwise (Source: Thomson Reuters Insider).
Director	A dummy is equal to 1 if one insider takes the position of director as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
CEO	A dummy is equal to 1 if one insider takes the position of CEO as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
CB	A dummy is equal to 1 if one insider takes the position of board chairman as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
CFO	A dummy is equal to 1 if one insider takes the position of CFO as classified by Thomson Reuters Insider database and 0 otherwise (Source: Thomson Reuters Insider).
7-year HOR	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).
5-year HOR	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).
LH	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).
Personalshock	An indicator is equal to one if a CEO is hit by events reducing career horizon as documented by Aktas et al. (2021) (Source: Aktas et al., 2021).
Firmshock	An indicator is equal to one if the firm is hit by events reducing CEO career horizon as documented by Aktas et al. (2021) (Source: Aktas et al., 2021).
Vega	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).
Pay duration	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)

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*10^3	30,545	-0.72	4.26	-0.14	-0.51	-0.03
STR_rank	30,545	0.37	0.29	0.25	0.25	0.50
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. Baseline Results

This table presents the regression results of baseline model testing association between insider investment horizon and overall CSR performance. Dependent variable is the measure of firm-level CSR performance. Independent variables are insider investment horizon, the interaction of insider investment horizon and trading strength, and a set of firm-level and insider-level control variables. 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)	(4)
HOR	0.038***	0.019	0.026**	0.003
	(3.16)	(1.41)	(2.19)	(0.26)
HOR×STR_rank		0.055***		0.062***
		(3.84)		(4.25)
Size	0.126***	0.124***	0.124***	0.122***
	(29.55)	(29.16)	(29.25)	(28.85)
Cash ratio	0.130***	0.128***	0.128***	0.126***
	(4.83)	(4.76)	(4.75)	(4.67)
CAPEX ratio	0.125	0.123	0.135	0.135
	(1.23)	(1.21)	(1.34)	(1.33)
Tangibility	-0.027	-0.030	-0.035	-0.040
	(-0.73)	(-0.84)	(-0.97)	(-1.11)
Tobin's q	0.009***	0.009***	0.009***	0.010***
	(3.66)	(3.71)	(3.81)	(3.88)
Leverage	-0.087***	-0.089***	-0.077***	-0.080***
	(-3.89)	(-4.00)	(-3.50)	(-3.61)
ROA	0.270***	0.274***	0.265***	0.269***
	(6.47)	(6.57)	(6.43)	(6.52)
R&D intensity	0.549***	0.533***	0.565***	0.548***
	(6.09)	(5.93)	(6.31)	(6.16)
A&D intensity	1.171***	1.174***	1.167***	1.171***
	(8.09)	(8.15)	(8.16)	(8.24)
Prior-year return	-0.017***	-0.016***	-0.017***	-0.016***
	(4.66)	(4.53)	(4.89)	(4.73)
Blue	0.064***	0.065***	0.063***	0.065***
	(6.08)	(6.20)	(6.11)	(6.28)
IO	-0.095***	-0.089***	-0.086***	-0.078***
	(-3.78)	(-3.53)	(-3.43)	(-3.11)
Age			-0.001	-0.001*
			(-1.50)	(-1.78)
Tenure			0.003***	0.003***
			(4.06)	(4.52)
Gender			-0.115***	-0.112***
			(-6.72)	(-6.55)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.261	0.261	0.265	0.266
N	30,543	30,543	30,543	30,543

Table 3. CSR Strengths and CSR Concerns

This table 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 from 1996 to 2015. Column (1) and (2) tabulate the results regarding CSR strength while column (3) and (4) present the results of CSR concerns. All 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.

	Strengths		Concerns	
	(1)	(2)	(3)	(4)
HOR	0.001	-0.023**	-0.025***	-0.027***
	(0.16)	(-2.41)	(-2.92)	(-2.84)
HOR×STR_rank		0.066***		0.004
		(5.97)		(0.41)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.464	0.465	0.311	0.311
N	30,543	30,543	30,543	30,543

Table 4. Material and Immaterial CSR

This table 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 from 1996 to 2015. Column (1) and (2) tabulate the results regarding material CSR while column (3) and (4) present immaterial CSR. All 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.

	Material		Immaterial	
	(1)	(2)	(3)	(4)
HOR	0.015**	0.008	0.012	-0.005
	(2.31)	(1.15)	(1.37)	(-0.49)
HOR×STR_rank		0.018**		0.044***
		(2.41)		(4.28)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.170	0.170	0.244	0.244
N	30,543	30,543	30,543	30,543

Table 5. Different Types of 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 measure of firm-level CSR performance. All control variables used in the baseline model are considered. Variables are defined in Appendix A. Columns (1) and (2) report results of directors. Columns (3) and (4) show results of officers. Columns (5) and (6), columns (7) and (8), columns (9) and (10) present CEO, chair (CB), and CFO results, 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		Officer		CEO		CB		CFO	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HOR	0.043***	0.020	0.030*	0.011	0.086***	0.069**	0.064*	0.031	0.04	0.039
	(2.97)	(1.24)	(1.85)	(0.63)	(3.31)	(2.53)	(1.78)	(0.82)	(0.93)	(0.88)
HOR*STR_rank		0.061***		0.058***		0.067**		0.148***		0.002
		(3.40)		(3.02)		(2.18)		(3.16)		(0.04)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adj R2	0.264	0.265	0.266	0.267	0.273	0.274	0.278	0.282	0.251	0.251
N	16,560	16,560	19,860	19,860	4,854	4,854	2,745	2,745	2,511	2,511

Table 6. Robustness Tests

This table presents the results of robustness tests according to the baseline model by adopting a battery of alternative measures of CSR performance and insider investment horizon. Panel A reports the results with respect to three alternative measures of insider investment horizon. Column (1) and (2) show whether 7-year HOR affects CSR performance while the results based on 5-year HOR are reported in column (3) and (4). Column (5) and (6) present the effects of long-horizon insiders (LH) on CSR performance. In panel B, the results regarding three alternative CSR performance measure are reported. The results of raw CSR without considering the maximum number of positive and negative indicators under each ESG subcategory are reported in column (1) and (2). Column (3) and (4) show how CSR performance excluding zero CSR rating scores is affected by insider investment horizon while the results using the rank of firm-level CSR performance in each year. All 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.

Panel A. Alternative insider investment horizon						
	7-year		5-year		LH	
	(1)	(2)	(3)	(4)	(5)	(6)
HOR	0.022*	0.000	0.014	-0.008	0.021***	0.002
	(1.89)	(0.00)	(1.19)	(-0.61)	(2.67)	(0.25)
HOR*STR_rank		0.061***		0.060***		0.049***
		(4.20)		(4.36)		(2.97)
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Adj R2	0.265	0.265	0.264	0.264	0.265	0.266
N	29,564	29,564	29,535	29,535	30,543	30,543

Panel B. Alternative CSR						
	Raw		Non-zero		Rank	
	(1)	(2)	(3)	(4)	(5)	(6)
HOR	0.095	-0.044	0.031**	0.003	0.350***	0.230**
	(1.60)	(-0.68)	(2.09)	(0.17)	(4.20)	(2.52)
HOR*STR_rank		0.373***		0.074***		0.322***
		(5.24)		(4.22)		(3.47)
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Adj R2	0.352	0.353	0.301	0.302	0.210	0.210
N	30,543	30,543	25,004	25,004	30,543	30,543

Table 7. CEO Career Concern Effects

This table shows the difference-in-difference regression results using the CEO career concerns as exogenous shocks to insider 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) reports the results, focusing on the CEOs of treated and control firms; column (2) shows the results regarding all insiders of treated and control firms. All control variables used in the baseline model are considered. 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 the 1%, 5%, and 10% level, respectively.

	CEO Only	All insiders
	(1)	(2)
HOR	0.260*	0.032
	(1.82)	(0.58)
HOR×Personalshock	-0.154*	
	(-1.65)	
Personal shock	0.437*	
	(1.70)	
HOR×Firmshock		-0.213**
		(-2.52)
Firmshock		0.300***
		(4.07)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.282	0.320
N	365	2,397

Table 8. Inevitable Disclosure Doctrine Effects

This table shows the difference-in-difference regression results using the rejection and adoption of IDD as exogenous shocks to insider horizon. The sample period spans from 1996 to 2015. Dependent variable is firm-level CSR performance. Panel A shows results of difference-in-difference approach testing whether insider investment horizon affects CSR performance based on IDD rejection. Panel B presents similar results based on IDD adoption. All 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.

Panel A. Rejection of IDD	
	CSR
HOR×IDD rejection	0.055**
	(2.37)
HOR	0.001
	(0.09)
IDD rejection	-0.011
	(-0.53)
Controls	YES
Year FE	YES
Industry FE	YES
Adj R2	0.264
N	30,543
Panel B. Adoption of IDD	
HOR×IDD adoption	-0.074***
	(-3.25)
HOR	0.056***
	(3.58)
IDD adoption	0.012
	(0.62)
Controls	YES
Year FE	YES
Industry FE	YES
Adj R2	0.267
N	30,543

Table 9. 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 turnover measure results (Gasper, Massa, and Matos, 2005). Column (2) reports churn rate results (Yan and Zhang, 2009). Column (3) shows socially responsible institutional investors (UNPRI signatories). All 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**	0.155***	0.002
	(2.29)	(3.19)	(-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 10. 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 vega results (Coles, Daniel, and Naveen, 2006) in 1996–2015. Column (2) shows pay duration results (Gopalan et al., 2014) in 2006–2015. All 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	-0.087*
	(1.47)	(-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 11. Cross-Sectional Analyses – Antitakeover Law

This table shows the difference-in-difference regression results using the adoption of business combination (BC) laws as exogenous shocks. The sample period spans from 1996 to 2015. Dependent variable is firm-level CSR performance. Column (1) shows the regression results without controlling for other major types of second-generation antitakeover laws. The results after controlling other types of antitakeover laws are displayed in Column (2). All 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 the 1%, 5%, and 10% level, respectively.

	Dependent Variable: CSR	
	(1)	(2)
HOR×BC law	0.083**	0.090**
	(2.06)	(2.22)
HOR	-0.050	-0.056
	(-1.29)	(-1.45)
BC law	-0.045	-0.050
	(-1.28)	(-1.43)
CS law		-0.039***
		(-2.73)
FP law		0.008
		(0.55)
DD law		-0.024
		(-1.10)
PP law		0.094***
		(4.49)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.265	0.268
N	30,543	30,543

Table 12. Real Effects — Toxic Releases

This table shows the regression results regarding the real effects of insider investment horizon on toxic releases from 1996 to 2015. Columns (1), (2), and (3) present results using total releases, off-site releases, and off-site releases as dependent variables, respectively. All 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	Total releases	On-site releases	Off-site releases
	(1)	(2)	(3)
HOR	-0.610**	-0.792***	0.098
	(-2.49)	(-2.89)	(0.30)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.420	0.406	0.367
N	6,182	6,182	6,182

Table 13. Real Effects — CSR Compliance Violations

This table shows the regression results regarding the real effects of insider investment horizon on CSR violations from 2000 to 2015. In Column (1), dependent variable is an indicator showing whether one firm has any CSR violations each year. We estimate a probit specification using the entire sample. In Column (2), the dependent variable is total amount of related CSR violation penalties. We estimate a linear specification using the sample including firms with non-missing amount of CSR penalties. All 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 violation indicator	CSR violation penalties
	(1)	(2)
HOR	-0.104**	-3.179*
	(-1.99)	(-1.87)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj / Pseudo R2	0.321	0.406
N	30,371	6,374

Table 14. Real Effects — Employee Satisfaction

This table shows the regression results regarding the real effects of insider investment horizon on employee satisfaction. Dependent variable is Best 100 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 and logit specification using the entire sample in Columns (1) and (2), respectively. All 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	Best 100 indicator	
	Probit	Logit
	(1)	(2)
HOR	0.412***	0.909***
	(3.56)	(3.62)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Pseudo R2	0.413	0.258
N	25,614	25,614

Table 15. Real Effects — RepRisk index and CSR incidents

This table shows the regression results regarding the real effects of insider investment horizon on RepRisk index (RRI) and ESG incidents from 2007 to 2015. In Column (1), the dependent variable is the average annual RepRisk index (RRI), which captures and quantifies a firm's exposure to ESG risks. In Column (2), the dependent variable is the annual number of ESG incidents collected by RepRisk. All 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.

Dependent variable	ESG incidents	RRI
	(1)	(2)
HOR	-1.419**	-0.805**
	(-2.51)	(-2.39)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.296	0.544
N	15,880	15,880

Internet Appendix

Table IA1. Insider horizon and future firm performance

This table presents the regression results regarding the effects of insider investment horizon on future firm performance. Panel A reports the results with respect to return on assets (ROA) in year t+1 and t+2. In Panel B, the results regarding Tobin'Q in year t+1 and t+2 are presented. Panel C shows the results for asset growth in year t+1 and t+2. All control variables used in the baseline model are included and these variables are defined in Appendix A. The sample spans from 1996 to 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.

	Panel A TobinQ			
Dependent Variable	TobinQ(t+1)		TobinQ(t+2)	
	(1)	(2)	(3)	(4)
HOR	0.048***	0.039**	0.054**	0.056**
	(2.95)	(2.07)	(2.21)	(2.07)
HOR*STR_rank		0.023		-0.005
		(1.03)		(-0.21)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.748	0.748	0.627	0.627
N	29,536	29,536	28,339	28,339
	Panel B Asset growth			
Dependent Variable	Asset growth(t+1)		Asset growth(t+2)	
	(1)	(2)	(3)	(4)
HOR	-0.026***	-0.016**	-0.022***	-0.011
	(-4.06)	(-2.37)	(-3.52)	(-1.52)
HOR*STR_rank		-0.026***		-0.031***
		(-3.48)		(-4.19)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.748	0.748	0.627	0.627
N	29,544	29,544	28,345	28,345
	Panel C Return on Assset (ROA)			
Dependent Variable	ROA(t+1)		ROA(t+2)	
	(1)	(2)	(3)	(4)
HOR	0.001	0.002	0.004**	0.004*
	(0.83)	(1.41)	(2.08)	(1.84)
HOR*STR_rank		-0.003		-0.001
		(-1.46)		(-0.17)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.698	0.698	0.542	0.542
N	29,529	29,529	28,329	28,329

Table IA2. Alternative Measures of Insider Trading Direction

This table presents the results of robustness tests by using alternative measures to distinguish long-term buyers and sellers in addition to trading strength rank (STR_rank). Column (1) reports results using interaction terms insider investment horizon and trading strength rank in previous years (STR_rank10), calculated using previous ten-year trading behavior. Column (2) introduces interaction terms insider investment horizon and *Netbuyer10*, which takes the value of one if insider made a net purchase over the past ten years and zero otherwise. All 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)
HOR	0.001	0.023*
	(0.06)	(1.87)
HOR*STR_rank10	0.054***	
	(3.47)	
HOR*Netbuyer10		0.026*
		(1.85)
Controls	YES	YES
Year FE	YES	YES
Industry FE	YES	YES
Adj R2	0.267	0.265
N	28,206	30,543

Table IA3. Firm-level Measures of Insider Horizon

This table presents the replicated baseline results using alternative firm-level insider horizon measures. Column (1) reports results using the fraction of long horizon insiders (*Frac_LH*), calculated as the ratio of the number of insiders with *HOR* equaling one who made at least one trade in a recent year on the number of all insiders who make at least one trade in recent year for a given firm. Column (2) constructs measure of fraction of opportunistic insiders (*Frac_opportunistic*) for each firm as the ratio of the number of opportunistic insiders who made at least one trade in a recent year on the number of all insiders who make at least one trade in recent year (Ali and Hirshleifer, 2017). To define opportunistic insiders, we first calculate the profits of insider trades before quarterly earnings announcements (QEA) and average the profits of all pre-QEA trades in the past for each insider. Next, we rank insiders at the beginning of each year into quintiles based on their average pre-QEA trading profits and the five insiders with the highest pre-QEA profitability in each quintile are regarded as opportunistic insiders. Column (3) reports results using fraction of routine insiders, calculated as the ratio of number of routine insiders who made at least one trade in a recent year on number of all insiders who made at least one trade in recent year for a given firm. Building on Cohen, Malloy, and Pomorski (2012), we define routine insiders as those who place a trade in the same calendar month for at least three consecutive years. All 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)
Frac_LH	0.055***		
	(2.88)		
Frac_opportunistic		-0.052**	
		(-2.20)	
Frac_routine			0.046***
			(3.83)
Controls	YES	YES	YES
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Adj R2	0.197	0.203	0.199
N	23,304	22,170	24,605

Table IA4. Subsample Analysis

This table presents the results of a subsample analysis. We first split the sample into two parts (i.e., 1996-2005 and 2006-2015) and then replicate our baseline results within these two samples respectively. Columns (1) and (2) tabulate the results for the sample spanning from 1996 to 2005. Columns (3) and (4) report the results for 2006–2015. All 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.

	1996–2005		2006–2015	
	(1)	(2)	(3)	(4)
HOR	0.016	0.016	0.031**	-0.001
	(0.91)	(0.80)	(2.27)	(-0.02)
HOR*STR_rank		0.000		0.085***
		(0.00)		(5.20)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adj R2	0.26	0.26	0.288	0.289
N	6,214	6,214	24,329	24,329