

The Effect of ESG-motivated Turnover on Firm Financial Risk

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Abstract

This study investigates how effectively a forced CEO turnover mitigates firm's financial distress that is triggered by a bad reputation for its Environmental, Social, and Governance (ESG) practices. We find that a firm's CEO dismissal decision significantly reduces the level of its financial distress—measured by Altman's Z-Score—subsequent to negative media coverage of the firm's ESG practices. This suggests that the forced CEO turnover may be taken as an ex-post damage instrument. Additional results show that the moderating effect of the CEO dismissal is stronger in firms under greater market scrutiny conditioned on various mechanisms: market competition, sin stock industry, and analyst coverage.

JEL Classifications: G30, G32, M10, J63

Keywords: ESG risk, Forced CEO turnover, Firm distress

I. Introduction

*“It takes many good deeds to build a good reputation, and only one bad to lose it.”
by Benjamin Franklin*

A growing literature in business and finance highlights how a firm’s various stakeholders discipline its Environmental, Social, and Governance (ESG) practices. The literature empirically documents that a bad reputation or a negative media coverage for a firm’s ESG practices triggers subsequent adverse reactions against the firm by its stakeholders, including customers, investors, and lenders. For example, customers boycott the firm’s products (Ganchev, Gianneti, & Li, 2020), institutional investors disinvest in the firm’s equity stocks (Krueger, Sautner, & Starks, 2020), and lenders terminate their lending relationship with the borrower firm (Houstan & Shan, 2019) in response to its deteriorated reputation due to the firm’s ESG practices.

Those disciplinary actions may seriously threaten the firm’s survival in the near future unless suitable corrective actions are taken by the firm to calm stakeholders’ angers. One of the observable corrective actions used by firms subject to misconducts is a CEO replacement. For example, Hazaika, Karpoff, & Nahata (2012) document that firms tend to replace their CEOs following firms’ financial misconducts, such as fraudulent financial reporting. Colak, Korkeamäki, & Meyer (2020) and Burke (2021) empirically show that ESG-related negative media coverage increases the probability of CEO turnover. However, there is little evidence on the effect of CEO replacements on firms’ subsequent financial performances after stakeholders’ adverse responses to their ESG practices. In this study, we fill the gap by investigating how effectively a forced CEO turnover alleviates firm’s financial distress that is triggered by a negative media coverage of its ESG practices.

For our empirical tests, we rely on *RepRisk* database to identify the degree of negative media coverage for firms' ESG practices. The *RepRisk* quantifies each company's ESG reputation by monitoring various sources, including media, newsletters, and social media (e.g., blogs). As the main specification in our study, we convert the original monthly *RepRisk* indices into an annual average for each firm-level. This annual index ranges from 0 to 100 with a mean value of 9.4. The higher the index, the worse the firm's ESG reputation covered by the media sources. We employ Altman's Z-score for firm financial distress. This score measures firm's bankruptcy likelihood by taking into account its profitability, leverage, liquidity, solvency, and activity ratios. As the score decreases, the firm's overall financial distress deteriorates. For CEO turnovers, we use forced CEO turnover as they are more likely a disciplinary event (Kang & Shivdasani, 1995) than a voluntary turnover. We identify forced CEO turnover data following Eisfeldt & Kuhnen (2013), Peters & Wagner (2014), and Gentry, Harrison, Quigley, & Boivie (2021). We construct a dummy variable that takes a value of one if the firm decides a forced CEO dismissal in the current year and zero otherwise. In our empirical tests, we relate the firm's annual ESG reputational risk constructed by *RepRisk* as of the previous year to its Altman's Z-score in the current year, which is further interacted by the current year's forced CEO turnover dummy variable.

All our regression models include firm-level covariates to control for potential confounding effects of the firm-level characteristics on its financial distress. We also include industry and year fixed effects in all of our regression models to control for the effects of industry-level, time-invariant characteristics and year-specific factor on the firm distress.

We first identify the relationship between a firm's (one-year) lagged ESG reputational risk and its financial distress in the subsequent year unconditionally. The test result highlights that if a firm suffers from prior year's poor reputation on media over its ESG practices, the firm tends to

face higher financial distress. This result may be due to stakeholders' disciplinary actions following the negative media coverage over its ESG practices, such as customers' boycotting the firm's products or investors' disinvesting in the firm's equity shares.

Next, we find the strong negative relationship between prior year's ESG reputation and current year's financial distress is significantly mitigated if the firm replaces the CEO in the current year. Our results are consistent even when we use other variables to measure firm financial distress or ESG reputations. To identify the main driver behind the mitigating effect of the forced CEO turnover on the financial distress of a firm with a bad ESG reputation, we then decompose the financial distress risk measure (Altman's Z-score) into five different components. The five components are listed as follows: working capital over total assets, retained earnings over total assets, earnings before interests and taxes over total assets, market value of equity over total liabilities, and sales over total assets. Interestingly, we find that the forced CEO turnover significantly alleviates the negative effect of a firm's bad ESG reputation only on its market value of equity scaled by its total assets, which implies that shareholders are especially responsive to CEO turnovers following the negative media coverage of the firm's ESG practices, and equity holders being the main driver behind the mitigation of the firm's financial distress afterward.

Additionally, we find that the moderating effect of forced CEO turnover is greater if the firm's ESG incidents are covered by influential media sources, more conspicuous for environmental-related issues than for social or governance-related ones, and more pronounced if the firm is under greater external market scrutiny, such as firms in sin industry, a highly competitive sector, and those subject to high analyst coverage. We also find that the moderating effect of the CEO turnover is stronger if the CEO serves as chair of the board.

While a conclusive endogeneity correction cannot be made in our empirical tests, we attempt multiple approaches to mitigate the endogeneity concerns. First, we include various firm and CEO level covariates in our regression models to reduce omitted variable problems. We also include industry and year fixed effects to account for aggregate industry conditions and time trends. In addition, to address any measurement error concerns, we conduct the robustness analysis using various measures of ESG reputational risk and firm distress. Moreover, we show robust results in sub-sample analysis. Specifically, we exclude the Oil and Gas industry firms and the pre-global financial crisis (2008) period to verify that our results are not determined by excess industry or market volatility during our sample period. Resolving potential simultaneity issues is particularly challenging in our research setting. We use a dummy variable that identifies regions with severe climate change risk as an instrument for the ESG reputation of the firm with headquarters located in the region to resolve the endogeneity concern. Our identifying assumption is that if a firm's headquarters is placed in a region with severe climate change risk, then the firm's negative ESG incidents are more seriously covered by the media. We further assume that the severe climate change risk around the firm's headquarters is not directly related to its financial distress. Our results are robust under the instrumental approach.

Our study contributes to several strands of literature. First, our study shows negative media coverage of a firm's ESG practices increases its subsequent financial distress likelihood, which extends and complements prior studies on the relationship between a firm's ESG practice and various types of firm risk (Sun & Cui, 2014; Bouslah, Kryzanowski, & M'Zali, 2018; Albuquerque, Koskinen, & Zhang, 2019; Boubaker et al., 2020; Hoepner et al., 2021; Ilhan, Sautner, & Vilkov, 2021; Murata & Hamori, 2021). However, our study is different in that we measure a firm's ESG reputational risk based on non-subjective external media sources provided by the *RepRisk* database,

while prior studies mainly rely on MSCI ESG ratings created by the firm's self-reported information.¹

Second, our study contributes to the forced CEO turnover literature by highlighting that the CEO replacement effectively mitigates the negative effect of high reputational risks of ESG issues on firm financial distress by alleviating shareholders' concerns. Prior studies have discovered various motivations for CEO turnover and following competing market reactions (Huson, Parrino, & Starks, 2001; Dimopoulos & Wagner, 2016; Bernard, Godard, & Zouaoui, 2018; Berger, Ofek, & Yermack, 1997; Clayton, Hartzell, & Rosenberg, 2005). However, the current CEO turnover literature does not offer evidence of the impact of ESG-motivated CEO turnover in relation to firm's financial performance. Our study mainly analyzes the effect of a CEO dismissal decision on a firm's financial risk when ESG reputation is under threat.

Lastly, our study is relevant to the literature on the determinants of financial distress (Opler & Titman, 1994; Campbell, Hilscher, & Szilagyi, 2008; Zhang, 2015). Among others, our paper is directly associated with Al-Hadi et al. (2019) and Chang, Yan, & Chou (2013), who find a negative association between CSR and firm distress risk. Similarly, our evidence suggests that firms with low ESG profiles, as reflected by its reputational risk covered by media (*RepRisk*), will suffer higher financial distress risk. Our study attempts to resolve endogeneity issues using various approaches, including fixed effects, alternative measures, sub-sample, and instrumental variable tests. Further, we extend the literature by showing that such distress risk can be mitigated by taking corrective action via CEO termination and that the decreased firm distress from CEO replacement is in fact due to alleviating the shareholders' concerns.

¹ For example, Boubaker et al. (2020) examine the ESG impact on firms' financial distress using MSCI ESG ratings from 1991 to 2012. MSCI ESG rating was formerly known as Kinder, Lydenberg, & Domini's (KLD) ratings.

To the best of our knowledge, this study is the first to empirically test the predictability of ESG-motivated CEO replacement on a firm's financial distress. Our evidence on the effectiveness of CEO firing on a firm's financial distress is important from a market perspective because the result implies that an effective and timely corporate decision protects both future firm viability and the shareholders from losing more due to the firm falling into such distress.

2. Related Literature

2.1 ESG and media reputation

ESG criteria refer to a set of standards for how companies incorporate environmental, social, and governance issues into their operations and are an increasingly popular tool for investors to evaluate companies' performance (Edmans, 2011; Barko, Cremers, & Renneboog, 2018). Numerous recent studies show a positive effect of ESG activities on firm performance and reputation while showing attenuating effect on firm risk. For example, Deng, Kang, & Low (2013) find that acquiring firms with a better CSR score supports the positive effect of ESG practices on the acquiring firm because the firm's higher CSR score indicates higher merger announcement returns, reduced time to complete the merger, and a lower likelihood of failing the merger. Servaes & Tamayo (2013) find a positive effect of CSR on firm value and this effect is particularly pronounced in well-governed firms (Bénabou & Tirole, 2010; Ferrell, Liang, & Renneboog, 2016). Lins, Servaes, & Tamayo (2017) find that high-CSR firms had higher stock returns, profitability, growth, and sales than the low-CSR firms during 2008-2009 financial crisis. Their results suggest that sound ESG practices reflect trust between a firm and its stakeholders, which pays off during market turmoil. On the other hand, Kruger (2015), Capelle-Blancard & Petit (2019), and Grewal, Riedi, & Serafeim (2019) find that firm value drops when firms experience negative ESG events.

Byun & Oh (2018) also highlight the beneficial effects of CSR on firm value via media attention and Cahan et al. (2015) show that firms engaged in CSR activities gain more favorable media coverage.

Furthermore, firms' engagement in positive ESG activities tends to reduce firm risk. For example, Ilhan, Sautner, & Vilkov (2021) show that firms with low environmental profiles that have higher carbon emissions tend to have larger downside tail risks, whereas Hoepner et al. (2021) provide evidence that positive ESG engagement, particularly when addressing climate change, can reduce firm's downside risk. Albuquerque, Koskinen, & Zhang (2019) develop a theoretical model that predicts that ESG engagement decreases firm systematic risk and increases firm value; they find supporting empirical evidence. Kölbel, Busch, & Jancso (2017) show that ESG-related negative media coverage increases credit risk for the firm. Additionally, Boubaker et al. (2020) show that more engagement in CSR practices leads to lower distress and default risks because better CSR performance makes firms more creditworthy. Bouslah, Kryzanowski, & M'Zali (2018) show that CSR acts as a risk reduction tool during financial crisis.

Other papers empirically document how a firm's bad reputation for ESG practices triggers subsequent adverse reactions against the firm by its stakeholders. For example, customers boycott the firm's products (Ganchev, Gianneti, & Li, 2020), institutional investors disinvest in the firm's equity stocks (Krueger, Sautner, & Starks, 2020), and lenders terminate their lending relationship with the borrower firm (Houston & Shan, 2019) in response to a firm's deteriorated ESG reputation due to its practices.

2.2 CEO turnover

A threat of dismissal is one method to incentivize the managers to work for the shareholders' interests (Gibbons & Murphy, 1990; Kwon, 2005; Hallman, Hartzell, & Parsons, 2011). It has been documented that firms are more likely to replace their CEOs when the firm's preceding financial performance is poor (Coughlan & Schmidt, 1985; Warner, Watts, & Wruck, 1988; Weisbach, 1988; Murphy & Zimmerman, 1993; Parrino, 1997; Jenter & Kanaan, 2015; Jenter & Lewellen, 2021), its idiosyncratic risk increases (Bushman, Dai, & Wang, 2010), it experiences financial distress (Gilson, 1989), or it encounters financial misconducts (Agrawal, Jaffe, & Karpoff, 1999; Desai, Hogan, & Wilkins, 2006; Hazarika, Karpoff, & Nahata, 2012; Aharony, Liu, & Yawson, 2015; Agrawal & Cooper, 2017).

Additionally, when the media covers the firm negatively, directors are incentivized to fire the CEO so as not to affect their reputations negatively (Fama, 1980; Fama & Jensen, 1983), while the managers are distracted from being an effective leader (Sutton & Galunic, 1996). As a result, negative media coverage tends to increase CEO turnover probability. In fact, Farrell & Whidbee (2002) find that negative media coverage of firm's poor performance increases forced CEO turnover probability. Particularly, Burke (2021) and Colak, Korkeamäki, & Meyer (2020) show that ESG-related negative media coverage also increases the probability of CEO turnover.

The current literature offers various corporate outcomes following CEO turnover driven by the above conditions. When there is a CEO turnover due to prior poor performance, it is generally found that stock reacts positively (Weisbach, 1988; Furtado & Rozeff, 1987; Bonnier & Bruner, 1989; Huson, Parrino, & Starks, 2001; Denis & Denis, 1995; Kang & Shivdasani, 1995; Dimopoulos & Wagner, 2016) to the news. In addition, CEO turnovers result in lower earnings management and greater corporate sustainability performance (Hazarika et al., 2012; Bernard, Godard, & Zouaoui, 2018).

Conversely, negative aspects following CEO turnovers are presented in the literature as well. Bonnier & Bruner (1989) show that unexpected turnover news trigger negative stock market reactions. Clayton, Hartzell, & Rosenberg (2005) argue that CEO turnover events increase future stock volatility due to an uncertain future operating performance along with unresolved firm policies. Berger, Ofek, & Yermack (1997) claim that firm leverage is increased after the CEO turnover and Adams & Mansi (2009) show that CEO turnover events are associated with lower bondholder values.

However, none of the prior studies explore the effect of ESG-motivated CEO turnover in relation to a firm's financial risk.

2.3 Firm distress

Although financial distress does not always lead to firm failure, distressed firms generally show a significant decline in firm performance, leading to firm bankruptcy (Habib et al., 2020). As a result, investors and creditors of financially distressed firms will usually suffer huge financial loss. Prior literature depicts financial distress as a costly event because of free-rider and information asymmetry problems, which impairs access to credit and leads to losses in earnings and sales (Altman, 1984; Gertner & Scharfstein, 1991). Particularly, financial distress is more costly when financial claims are spread among various creditors (Hoshi, Kashyap, & Scharfstein, 1990). Opler & Titman (1994) find that firms that are highly leveraged are particularly vulnerable to financial distress. Campbell, Hilscher, & Szilagyi (2008) show that firms with higher leverage, lower profitability, lower market capitalization, lower past stock returns, more volatile past stock returns, lower cash holdings, higher market-to-book ratios, and lower prices per share are more likely to file for bankruptcy, be delisted, or receive a D rating. Additionally, they show that

financially distressed stocks tend to have anomalously lower returns but much higher standard deviations. Furthermore, Zhang (2015) finds that firms with high R&D investments are more likely to experience financial distress and that such a relationship is exacerbated during economic recessions and for constrained firms more than the unconstrained firms. A negative relationship between CSR performance and firm financial distress has been documented as well (Chang, Yan, & Chou, 2013; Al-Hadi et al., 2019).

3. Hypothesis Development

In this section, we develop testable hypotheses for forced CEO turnover's effect on firm's financial distress following negative media coverage on its ESG practices. As documented in the literature, a firm's bad management of its ESG reputation may threaten the firm's future viability through immediate and subsequent disciplinary actions by its stakeholders. Those disciplines include customers' boycott of the firm's products (Ganchev, Giannetti, & Li, 2020), investors' disinvestment in the firms' stocks (Krueger, Sautner, & Starks, 2020), and lenders' termination of the lending relationship with the firm (Houston & Shan, 2019). To reduce the threat of stakeholders' disciplines and promote the firm's long-term viability in the future, the firm may need to take effective and impactful corrective actions. One of the remedies employed by the firm is through CEO replacement. As empirically investigated in Colak, Korkeamäki, & Meyer (2020), firms negatively covered by the media for their ESG policies are more likely to replace their CEOs. Burke (2021) further finds that the negative coverage of firms' ESG issues by prominent media sources is more likely to lead to the firm's CEO dismissal.

Despite the use of a CEO replacement in response to negative media coverage of the firm's ESG issues, it is still underexplored how forced CEO turnover makes an impact on the firm with

bad ESG reputation. Does the negative media coverage for ESG policies indeed deteriorate the firm's future viability, triggering the firm's financial distress due to the stakeholders' disciplinary actions? Is the forced CEO turnover truly effective in mitigating the adverse consequences of the ESG-related negative media coverage on the firm's future viability? What are the specific channels through which forced CEO turnovers to mitigate the firms' financial distress following negative media coverage for their ESG practices? These questions are our main research motives addressed in this study.

Before hypothesizing the effectiveness of forced CEO turnovers in our study, we first predict how the adverse reactions by firms' stakeholders following negative media coverage for their ESG management affect the firms' operational and financial conditions. If the disciplinary actions by customers, suppliers, shareholders, and lenders happen simultaneously after the negative media coverage, those disciplines may drop the firm's total sales (by customers), increase its operating costs (by suppliers), lower its market values (by shareholders), and raise its financing costs (by lenders) at the same time. Although each of those adverse events may hurt the firm's financial performance only marginally, their simultaneous collective consequences can be sizable. This will ultimately lead to its severe financial distress unless the firm is able to resolve or mitigate those collective disciplinary actions quickly.

Our next question is whether and how effectively the forced CEO turnovers alleviate such adverse financial consequences of the firm following its ESG-related negative media coverage. To answer this question, we need to figure out whether forced CEO turnovers have a meaningful impact on relaxing stakeholders' critical views against the firm's current ESG practices. If CEO replacement successfully relieves stakeholders' complaints of the firms' ESG management, this will weaken their disciplinary actions against the firms. For example, placated shareholders, such

as ESG-oriented mutual funds, will keep their investments in equity shares of the firms, which is helpful in maintaining market values and promoting the financial performance of the firms. Corporate governance literature documents that CEO turnovers are effective in relieving the stakeholders' adverse reactions to the firms' misbehaviors, such as their poor earnings management (e.g., Gangloff, Connelly, & Shook, 2016; Hazaika, Karpoff, & Nahata, 2012). Our question at this stage is whether the effectiveness of CEO replacement in mitigating stakeholders' adverse reactions to the firms' financial misconducts is applicable to firms' ESG poor reputations.

Bernard, Godard, & Zouaouri (2018) document that the change of CEOs has a positive and significant effect on the firm's corporate sustainability performance in the following 5 years. Their findings suggest that CEO turnovers have positive effects on firms' ESG policies in the long run. From their empirical findings, we can conjecture that a forced CEO turnover itself can create a positive expectation to its key stakeholders that the firm's ESG management will be improved in the future under the new leadership, although the immediate change made to its current ESG policy is yet indistinguishable. Given the positive prospects for improvement of the firm's future ESG practices, stakeholders may be placated and hence stop or postpone their disciplinary actions against the firm. This will ultimately enhance the firm's financial performance and mitigate its financial distress, which was originally triggered by the negative media coverage of its poor ESG management.

With this background, we hypothesize that a firm replacing its CEO in response to negative media coverage of its ESG practices is more likely to relieve its financial distress than the firm without such CEO replacement.

4. Data and Sample Statistics

4.1 Sample construction

We construct an initial sample using the US-listed firms covered in the *RepRisk* database over the period from 2007 to 2015. We then merge this sample with additional firm-level financial data from *Compustat* and *CRSP*. We exclude financial firms and utilities due to the differences in accounting and regulations. For our empirical analysis, we obtain the final sample of 6,429 firm-year observations that have forced CEO turnover data available during our sample period.

4.2 ESG reputational risk

We measure a firm's ESG reputational risk using the media coverage of ESG-related incidents provided by the *RepRisk* database.⁵ *RepRisk* tracks the number of environmental, social, and governance news events for over 120,000 public and private firms around the world as of 2015. To measure firm's reputational risk exposure associated with ESG issues, *RepRisk* monitors 28 ESG-related news reported in media as well as other additional sources (e.g., NGOs, government bodies, newsletters, etc.) on a daily basis. This database is based on non-subjective external media sources and is often used in current studies relating to ESG reputational risk (Li & Wu, 2020; Asante-Appiah, 2020; Burke, Hoitash, & Hoitash, 2019a, b; Kölbel, Busch, & Jancso, 2017).⁶

We rely on three measures of a firm's ESG reputational risk. The first measure is *ESG RRI*, which is an annualized ESG reputation risk index (*current RRI* is reported monthly in the *RepRisk* database) constructed based on a proprietary formula of the news counts and scores.⁷ This measure

⁵ *RepRisk* is a company that uses artificial intelligence to track stakeholder-related ESG-issues covered in various media sources. *RepRisk* has started screening ESG issues since 2007 (www.reprisk.com).

⁶ *RepRisk* data is different from traditional measures of ESG/CSR performance from the Thomson Reuters ESG scores or KLD (MSCI) data and more suitable for our study. For example, traditional measures are based on the firm's self-reported information, which is internally created and can be overestimated with the manager's discretion. On the contrary, ESG data provided by *RepRisk* relies on significant external ESG-related media coverage evaluated by various stakeholders, which provides a more objective assessment of the effect of the firm's ESG-related reputational risk. Beyond the benefit mentioned above, *RepRisk* data may also reduce the concern of endogeneity in that it is difficult for managers to endogenously manipulate negative news detection across various sources of media channels.

⁷ See details from the *RepRisk* methodology document available at <https://www.reprisk.com>.

gauges the level of media and stakeholder exposure of a firm related to ESG issues during the fiscal year. Our second measure is *ESG Peak RRI*, which is the highest level of ESG reputation risk index over the last 24 months. Table 1 presents the summary statistics of ESG reputational risk measures. Both *ESG RRI* and *ESG Peak RRI* range from zero (lowest ESG reputational risk) to 100 (Highest risk).⁸ The mean value of *ESG (Peak) RRI* is 9.378 (18); the 25th and 75th percentiles are 0 (0) and 19 (30), respectively. Whereas the first two measures are based on the ESG reputation risk index constructed by *RepRisk*, our third measure of reputation risk, *Log ESG Total News*, is based on raw data on firm-level incident counts, which is defined as the natural logarithm of one plus the number of ESG news articles during the fiscal year. The mean *Log ESG Total News* is 0.908, indicating that around 7 ESG-related news articles appear during the year.

[Table 1 around here]

For additional regression analyses, we construct alternative measures of ESG risk based on the severity (the magnitude of the perceived impact of the risk incidents), reach, or novelty (the influence of the media source) of the media coverage. *Log High Severity News* is the natural logarithm of one plus the count of news of high severity news events.⁹ *Log High reach News* is the natural logarithm of one plus the count of high reach news on ESG issues.¹⁰ We further adopt three additional dichotomy measures depending on the category of ESG issues. *Environmental Issue Covered* is a dummy variable that equals one if the firm had at least one negative news article pertaining to its environmental issues during the year. *Social Issue Covered* is a dummy variable

⁸ ESG (Peak) RRI of 0 indicates that the current RRI was once above zero but had since fallen.

⁹ Each ESG incident is classified as either high, medium, or low depending on the consequences (e.g., no further consequences, injury, death), extent (e.g., one person, a group of people, a large number of people), and negligence associated with the risk incident.

¹⁰ The count of high reach news on ESG issues of a firm. Low influence sources include local media, smaller NGOs, local government bodies, etc. Medium influence sources include most national and regional media, international NGOs, and state, national, and international government bodies. High influence sources include international media (e.g., the FT, NY Times, WSJ, BBC, etc.)

that equals one if the firm had at least one negative news article pertaining to its social issues during the year. *Governance Issue Covered* is a dummy variable that equals one if the firm had at least one negative news article pertaining to its governance issues during the year. We allow measures of ESG reputation risk to be lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover.

4.3 Firm Distress

Our primary measure of financial distress is the Altman Z-Score. *Altman Z* measures the likelihood of firm's bankruptcy and is computed as follows:

$$\begin{aligned}
 \text{Altman Z Score} &= 1.2 \times (\text{Working Capital/Total Assets}) \\
 &+ 1.4 \times (\text{Retained Earnings/Total Assets}) \\
 &+ 3.3 \times (\text{EBIT/Total Assets}) \\
 &+ 0.6 \times (\text{Market Value of Equity/Total Liabilities}) \\
 &+ 0.99 \times (\text{Net Sales/Total Assets})
 \end{aligned} \tag{1}$$

The higher the probability that a firm goes into bankruptcy, the lower the Altman Z-Score (Altman, 1968). Table 1 shows that our sample firms have an average of 3.603 (median 2.851) for the Altman Z-Score; their 25th and 75th percentiles are 1.697 and 4.472, respectively, in a year. Table 1 also shows the summary statistics for each financial ratio (i.e., profitability, leverage, liquidity, solvency, and activity ratios) included in the *Altman Z* computation. For robustness check, we adopt several alternative measures of firm distress. *Altman Z-Distress Zone* is a dummy variable that equals one if the Altman Z-Score is less than 1.81 and zero otherwise. When the Altman Z-Score is less than 1.81, a firm is likely to head toward insolvency in the next two years (Altman, 1968). *Ind. Adj. Altman Z* is defined as the Altman Z-Score minus the median of Altman Z-Score of all firms in the same two-digit SIC code. As an alternative to *Altman Z-Score*, *O-Score* and *ZM-Score* are used, following Ohlson (1980) and Zmijewski (1984), respectively. The higher

the probability that firm goes into bankruptcy, the higher the *O-Score* and *ZM-Score*. *O-Score* and *ZM-Score* are constructed as follows:

$$\begin{aligned}
O\ Score = & - 1.32 - 0.407 \times \log(Total\ Assets/GNP) \\
& + 6.03 \times (Total\ Liabilities/Total\ Assets) - 1.43 \\
& \times (Working\ Capital/Total\ Assets) \\
& + 0.0757 \times (Current\ Liabilities/Current\ Assets) - 1.72 \\
& \times (1\ if\ Total\ Liabilities \\
& > Total\ Assets, 0\ otherwise) - 2.37 \times (Net\ Income \\
& /Total\ Assets) - 1.83 \times (Funds\ from\ Operations \\
& /Total\ Liabilities) \\
& + 0.285 \times (1\ if\ a\ net\ loss\ for\ the\ last\ two\ years, 0\ otherwise) \\
& - 0.521 \times [(Net\ Income - last\ year\ Net\ Income) \\
& /(|Net\ Income| + |last\ year\ Net\ Income|)]
\end{aligned} \tag{2}$$

$$\begin{aligned}
ZM\ Score = & - 4.336 - 4.513 \times (Net\ Income/Total\ Assets) \\
& + 5.679 \times (Total\ Liabilities/Total\ Assets) \\
& + 0.004 \times (Current\ Assets/Current\ Liabilities)
\end{aligned} \tag{3}$$

4.4 Forced CEO Turnover

We obtain forced CEO turnover data from Eisfeldt & Kuhnen (2013), Peters & Wagner (2014), and Gentry et al. (2021).¹¹ To identify forced CEO turnover for our analysis, we require that CEOs are in our sample for at least two years and CEOs are under the retirement age of 65. We define *Forced CEO Turnover* as an indicator variable that is equal to one if a forced CEO turnover occurs in the fiscal year and zero otherwise. The mean value of *Forced Turnover* is 0.0235, indicating, on average, around 2.3% of firm-year observations experience forced turnover events.

4.5 Control variables

¹¹ Forced turnover data is available at <https://sites.google.com/site/andrealeisfeldt/home/publications;> [https://www.florianpeters.org/data;](https://www.florianpeters.org/data) <https://zenodo.org/record/4543893#.YcyS-GjMKUk>

The set of our control variables includes firm size, leverage, profitability, market to book ratio, stock return volatility, R&D intensity, capital intensity, cash holdings, dividend payer indicator, sales growth, firm age, and institutional holdings. Firm size (*Log Assets*) is measured as the natural logarithm of the firm's total assets. The mean level of *Log Assets* is 8.264 (\$3.88 billion). ESG policies and their outcomes may vary over life cycle or firm size. To capture the variation in the effects of ESG risk on firm distress, we include the squared terms of firm size in the regression. *Leverage* is the ratio of long-term debt plus debt in current liabilities to total assets. *Volatility* is stock return volatility, which is a standard deviation of monthly earnings before interest, taxes, depreciation, and amortization over the previous 36 months, scaled by total assets. *Sales Growth* is the ratio of sales in year t minus sales in year $t-1$ to sales in year $t-1$. *Log Firm Age* is the natural logarithm of the number of years the firm appears in the *Compustat* database. *R&D Intensity* is the ratio of R&D expenses to total assets. *Capital Intensity* is the ratio of capital expenses to total assets. *Tangibility* is the ratio of net property, plant, and investment to total assets. *Dividend Payer* is a binary variable that equals one if the total amount of dividends paid on common stock is greater than zero and zero otherwise. *Institutional Holdings* is the percentage of ownership by institutional investors. To reduce skewness or data entry errors, we winsorize all continuous control variables at the 1% level and transform total assets and firm age by taking the natural logarithm.

5. Empirical Findings

5.1 ESG Reputational Risk and Firm Distress

We estimate OLS models to examine ESG reputational risk and its impact on firm's financial distress in the subsequent year. The dependent variable is *Altman Z-score* in year t . The primary ESG reputational risk variables used in Table 2 are one-year lagged (year $t-1$) *ESG RRI*,

ESG Peak RRI, and *Log ESG Total News*. These variables measure the firm's level of media and stakeholder exposure related to ESG issues and higher values of these measures indicate a greater ESG-related reputation loss encountered by the firm. In regressions, we control various firm characteristics that appear in year t , including firm size, leverage, stock return volatility, sales growth, firm age, R&D intensity, capital intensity, cash holdings, institutional holdings, and dividend payer indicators.¹² To confirm whether the effect varies in response to aggregate industry conditions and time trends, we include industry- or year-fixed effects in our models. Standard errors are robust and clustered by firm. The regression results are reported in Table 2.

[Table 2 around here]

In Models 1, 3, and 5, the coefficient estimates on the ESG risk measures are negative and significant at the 1% level. This negative association between ESG reputation risk and firm distress in the following year is not only statistically significant but economically meaningful. In Models 1, 3, and 5, an average ESG risk measure is associated with a decline of the Altman Z-Score of between -0.007 to -0.126. Similarly, a one standard deviation increase in the ESG risk measure is associated with a decline of the Altman Z-Score by -1% to -3%.¹³

We next investigate whether a firm's CEO replacement mitigates the impact of ESG reputational risk on financial distress. If the CEO dismissal decision is taken by the firm as a suitable corrective action to relieve stakeholders' concern or anger, we expect that the effect of ESG incidents on firm distress becomes weaker or increase the Altman Z-score, reflecting the firm's strong commitment to enhance its future prospects by disciplining the senior leadership

¹² Results remain the same when we include both contemporaneous and lagged control variables.

¹³ In Model 1, the economic magnitude is computed as $-0.015 \times \ln(1+9.374)/3.563$, where the mean value of *ESG RRI* for a firm is 9.374 and the within-firm standard deviation of the Altman Z-Score is 3.563. In Model 3, the economic magnitude is computed as $-0.126 \times \ln(1+0.908)/3.563$, where the mean value of *Log ESG Total News* for firm is 0.908 and the within-firm standard deviation of the Altman Z-Score is 3.563.

responsible the failure of ESG practices. To test this conjecture, we examine the interaction effect between ESG risk measures and forced CEO turnover.

Models 2, 4, and 6 of Table 2 report estimates from OLS regressions with interaction terms suggested above. Results show that the estimated coefficient of the interaction terms between ESG risk measures and forced turnover is positive and statistically significant at 1% or 5% and the interaction term magnitudes are appeared up to 17 percentage points. This result implies that the firms facing greater ESG reputational risk reduce the intensity of financial distress in the subsequent year through CEO replacement. Interestingly, the effect of ESG risk measures on the *Altman Z* is reversed when there is a forced turnover (e.g., Model 2: 0.024 – 0.016), which might indicate that some stakeholders concerned with the ESG incidents quickly turn their beliefs to the positive side of firm prospects.

Firm distress risk may arise more after the media coverage of ESG-related incidents is widely spread to stakeholders who actively or inactively participate in the market. To see if CEO replacement decisions are effective in a long-term time frame, we investigate the effect using the Altman Z-score in year $t+1$. Table A.1 in the Appendix shows that our findings remain consistent.

Although we mainly use forced CEO turnover as they are more likely disciplinary events (Kang & Shivdasani, 1995), it is worth examining whether voluntary CEO turnover leads to a similar effect of ESG reputational risk on firm distress.¹⁴ In Table A.2 in the Appendix, we test our main models using voluntary CEO turnover while excluding forced CEO turnover from the sample. Results show that the interaction effects are insignificant or only marginally significant,

¹⁴ In case of voluntary CEO turnover, stakeholders might be limited to evaluate whether the departure is due to the CEO's personal reasons (e.g., retirement, family issues, outside employment opportunities) or the CEO resigns or step down from the leadership position mainly due to the failure of maintaining a positive ESG reputation.

indicating that voluntary CEO turnover, regardless of its reasons, might not be as effective as forced turnover when translated into a firm's corrective actions for alleviating financial distress.

5.2 The role of CEO dismissal decision

Although we have so far shown that forced CEO turnover following ESG risk reduces the firm's financial distress, we have not yet discovered through which channels it decreases. As the Altman Z-score is composed of various financial ratios, it would be interesting to examine which components of Altman Z-score are mainly affected by the forced CEO turnover in relation to ESG risk. Specifically, Altman Z-score is computed by five different ratios: working capital/total assets (WC/TA), retained earnings/total assets (RE/TA), earnings before interests and taxes/total assets ($EBIT/TA$), the market value of equity/total liabilities (MVE/TL), and sales/total assets ($SALES/TA$).¹⁵

Table 3 reports the results using each of the above ratios as a dependent variable in the regression models. In the presence of the interaction term with forced CEO turnover, the stand-alone term of *ESG RRI* in Models 2, 3, and 4 is consistently negative. The estimated coefficients of the interaction terms are significant only in Model 4 across Panel A to C where the dependent variable is MVE/TL . In addition, the magnitude of coefficient (0.035) of the interaction term in Model 4 of Panel A is sizable relative to the coefficients (-0.000 to 0.002) in other models, suggesting that the shareholders, among various stakeholders, respond more sensitively to the firm's CEO replacement decision.¹⁶ This evidence implies that shareholders' concern arising from

¹⁵ WC/TA indicates the firm's short-term financial health. RE/TA indicates how the firm uses retained earnings to fund capital expenditure. $EBIT/TA$ indicates the firm's ability to generate profits solely from its operations. MVE/TL indicates the market confidence in the firm's financial situation and the degree to which the firm's market value would decline in the event of default. $SALES/TA$ indicates how efficiently the firm uses resources to generate revenues.

¹⁶ Similarly, the magnitude of coefficient (0.255) of the interaction term in Model 4 of Panel C is greater than those of the coefficients (-0.001 to 0.007) in other models.

bad ESG reputation are remedied by a firm's CEO replacement decision, and the reduced Altman Z-score in the prior tests are driven mainly by restored investor confidence in the company.

[Table 3 around here]

5.3 ESG incidents and news sources

RepRisk data reports for the firm-specific 28 ESG issues along with the details of the severity of the ESG issues and reach of the media outlet that covers the issue. We investigate whether the interaction effect of forced CEO dismissal differs across different levels of *Severity* of the issue and *Reach* of the media outlet. Particularly, *Severity* is determined as a function of the alleged violation of national laws and international standards. The given ESG incident is classified as either high, medium, or low depending on the consequences of the risk incident with respect to health and safety, the extent of the risk incident with respect to the number of people involved, and negligence associated with the risk incident. *Reach* refers to the influence or readership of the news source. Media source is classified as high, medium, and low reach depending on the prominence of the media source covering the risk incident. For example, low reach sources include local media, smaller NGOs, and local government bodies, whereas high reach sources include international media (e.g., the FT, NY Times, WSJ, BBC).

Table 4 shows the results. *Log High Severity News* is defined as the natural logarithm of one plus the count of ESG issues with high *Severity*. *Log High Reach News* is defined as the natural logarithm of one plus the count of high *Reach* sources covering ESG incidents. It appears that when there is no forced CEO turnover, the magnitude of *Log High Severity News* in Model 1 is quantitatively similar to that of *Log High Reach News* in Model 2. However, when we include both measures in Model 3, *Log High Reach News* shows larger coefficient estimates than *Log High Severity News*, indicating that ESG risk issues have a greater damaging effect when they are

distributed in international major media sources targeting various stakeholders rather than certain media-identified incidents. We also find that the coefficient estimates on the interaction term of forced turnover are statistically significant only with *Log High Reach News*. This result shows that when ESG issues are reported in high-reach media outlets, firm financial distress is decreased when forced turnover takes place. This implies that when ESG risk news is widely disseminated, the mitigating effect of CEO forced turnover on the negative reaction of ESG-conscious stakeholders seems to be more effective.

[Table 4 around here]

We also examine the differential responses to ESG specific categories employing three dichotomy measures. Results are reported in Table 4, Models 4 to 7. *Environmental Issue Covered* is an indicator variable that equals one if the firm had at least one negative news article pertaining to its environmental issues during the year. *Social Issue Covered* is an indicator variable that equals one if the firm had at least one negative news article pertaining to its social issues during the year. *Governance Issue Covered* is an indicator variable that equals one if the firm had at least one negative news article pertaining to its governance issues during the year. Models 4 to 5 show that given no forced CEO turnover (i.e., when *Forced Turnover* = 0), three ESG categories lead to a statistically significant effect and their magnitudes of coefficient estimates are quantitatively similar. In Model 7, we include all three ESG categories and find that the interaction effect of forced CEO turnover is statistically significant at the 1% level only for the *Environmental Issue Covered*, but it is not significant for the *Social Issue Covered*. Forced CEO turnover has a marginal moderating effect of reducing the level of firm distress when governance issues are covered. These

results indicate that when firms are subject to risks associated with environmental practices, the mitigating effect of CEO forced turnover seems to be more effective.¹⁷

5.4 Endogeneity

Endogeneity might be a concern when interpreting the negative moderating effect of forced CEO turnover on the relation between ESG reputation risk and firm distress. *RepRisk*'s ESG data itself may partly reduce the endogeneity concern since it is difficult for managers to endogenously manipulate negative news detection driven by various external media sources, such as national and international media outlets, government bodies, NGOs, or customer-driven social media. We further attempt to address the endogeneity issue in multiple ways.

First, we control for various firm characteristics and industry and year-fixed effects in the regression model. To differentiate an *ex-ante* event and *ex-post* firm decisions, we use lagged measures of ESG reputational risk as an *ex-ante* trigger event while we use contemporaneous CEO dismissal decision as an *ex-post* damage instrument. To find the change in the level of firm distress following the ESG risk, we consider Altman Z-score in year t in our main regression model. As reported earlier, in Table A.1 of the Appendix, we confirm the robustness of our finding to employing the Altman Z score in year $t+1$.

During the 2008 financial crisis, many firms were subject to a greater risk of distress and default. To reduce the concern that our findings are due to the increased market uncertainty or economic downturn in the period of the financial crisis, we examine a subsample in the post-crisis period in Table A.3 (Panel A) of the Appendix and confirm our findings. In addition, when a notable ESG incident appeared at an industry peer firm, other firms within the same industry may experience increased media attention on their ESG practices, which may in part affect the firm's

¹⁷ Prior studies using KLD database for the firm's ESG practice are concerned that KLD data is established based on the firm's self-reported information, which can be biased with the manager's discretion (Houston & Shan (2019)).

policies and future outlook (e.g., BP oil spill in 2010). Panel B of Table A.3 confirms that our results are consistent in the subsample, excluding Oil and Gas industry firms.

We also check whether our findings are obtained through other possible mechanisms. Strategic CSR spending is one potential instrument a firm may consider when they face reputational loss. Boubaker et al. (2020) show that firms initiating stronger ESG practices experience lower distress and default risks. Choi et al. (2020) show that firms around the trigger event, such as class action lawsuits, invest more in CSR practice as an ex-post damage control device. In Table A.4 of the Appendix, we examine whether the incremental effect of forced CEO turnover is compromised with the interaction effect between CSR spending and ESG risk measures. Results show that even though we consider the CSR investment in the models, the interaction effect of forced CEO turnover is still significant at the 1% level.

Simultaneity issue is one source of endogeneity. For example, firm distress and ESG risk or interaction effect of forced CEO turnover can be jointly determined by some unknown factors. To mitigate such concern, we employ the instrumental variable approach and report results from two-state least squares (2SLS) in Table 5. Our main endogenous explanatory variables are ESG risk measures and the interaction with forced turnover. We consider an indicator for the climate risk as an instrumental variable for firm's ESG reputation. *Climate Risk* is a dummy variable that equals one if a firm's headquarter is located in a county that is exposed to severe climate change risks (Painter, 2020). The assumption is that media attention specifically on ESG-related issues may appear more often in the region where residents' interests in ESG issues are high, thereby increasing the ESG risks for local firms, but we do not expect that climate risk directly affects firms' future survival.

[Table 5 around here]

Following Tsoutsoura (2015), we instrument ESG risk measures using *Climate Risk* and the interaction term between ESG risk measures and *Forced Turnover* using the interaction term between *Climate Risk* and *Forced Turnover* in the first-stage model. Specifically, the lagged values of endogenous ESG risk measures or the interaction term between lagged ESG risk measures and contemporaneous value of the forced CEO turnover used in the baseline structural model are regressed on the instrumental variables suggested above together with all other covariates used in the main equation of interest. Panel A of Table 5 shows the results. Model 1 shows that *Climate Risk* is positively and significantly correlated with *ESG RRI*. For example, given no forced turnover, the net effect of the stand-alone term of *Climate Risk* is 0.571, indicating that firms in the regions with high climate risk experience 57% more ESG reputational risk (*ESG RRI*) relative to firms located in low climate risk regions.

The first-stage model with the dependent variable of interaction between ESG risk and *Forced Turnover* shows similar results. In Model 2, the estimated coefficient of the interaction term *Climate Risk X Forced Turnover* is negative and significantly significant. In Models 1 and 2, the high *F*-statistics suggest that the instrumental variables are not weak.

In Model 3, we report the second-stage model using instrumented variables, *Predicted ESG RRI* or *Predicted ESG RRI X Forced Turnover*, calculated from first-stage models. The estimated coefficient on instrumented *ESG RRI* shows that with no forced CEO turnover, firms subject to ESG reputation risk experience on average of a 15-percentage point decline in Altman's Z-score. Conversely, firms with forced CEO turnover experience a 3-percentage point less decline in their Altman's Z score relative to firms with no forced turnover. In Panels B and C, we confirm these results using two alternative measures of ESG risk (*ESG PEAK RRI* and *Log ESG Total News*). Altogether, these consistent results show that when firms face high ESG reputation risk, CEO

dismissal decisions reduce the level of firm distress and that our results are unlikely to suffer from a simultaneity problem.

5.5 External Environments

We next investigate how the moderating effect of forced CEO turnover on firm distress varies across firms depending on several external environments. We consider three mechanisms: market concentration, sin industry classification, and analyst coverage. As these external mechanisms bring greater attention or scrutiny to the corporate world, stakeholders may react more sensitively to any deteriorating events and subsequent firm policies (Hong & Kacperczyk, 2009; Mola, Rau, & Khorana, 2013; Carboni et al., 2017). Conditioned on the level of such mechanisms, we could see how effectively the CEO dismissal decisions affect firms' financial distress associated with ESG reputational risk.

[Table 6 around here]

In Models 1 and 2 of Table 6, we partition the sample into terciles based on the level of market concentration proxied by *Herfindahl Index*, which indicates the degree to which sales are diversified across a firm's business segments (four-digit SIC industry code). To compare the moderating effect of forced turnover between the two subsamples using the Chow test (1960), we isolate the net effect of *ESG RRI* reflecting forced CEO turnover ($\beta_1(ESG\ RRI) + \beta_2(ESG\ RRI \times Forced\ Turnover)$) in each sample. Results across Panel A to C show that the moderating effect of forced turnover is stronger for firms under high market concentration, and the Chow test rejects the null hypothesis that the two subsamples have identical moderating effects of forced turnover.

In Models 3 and 4, we partition the sample by an indicator variable that equals one if a firm is in the sin stock industry (Alcohol, Gaming, and Tobacco) and zero otherwise (Hong & Kacperczyk, 2009). Results show the greater moderating effect of forced CEO turnover for firms

in the sin industries, and the Chow test confirms the significant difference in the effects between the two subsamples. In Models 5 and 6, we partition the sample into terciles based on analyst coverage. Results across Panel A to C show that the moderating effect of forced turnover is stronger for firms with greater analyst coverage and the Chow test confirms the difference in moderating effects of forced turnover between the two subsamples. Overall, the results indicate that the alleviating effect of forced CEO turnover on firm financial distress when ESG reputation is at stake is stronger in firms under greater external market scrutiny.

5.6 CEO Power and Authority

A forced CEO dismissal decision can be more noticeable and have a larger effect when the dismissed CEO is perceived as the one who has full responsibility for the failure of ESG practices. We expect that the moderating effect of forced CEO turnover is greater for firms run by CEOs holding the most power and authority, such as a CEO serving as chair of the board. We investigate this prediction in Table 7.

[Table 7 around here]

We interact the dummy of *CEO Duality* with the interaction term between ESG risk measure and forced CEO turnover. *CEO Duality* is an indicator variable that equals one if a CEO is a chairperson on the board. Consistently, we observe the positive estimated coefficient on the interaction term, *ESG RRI X Forced Turnover*. Results also show that the coefficient estimates on the triple interaction term, *ESG RRI X Forced Turnover X CEO Duality*, is positive and statistically significant at the 5% level, indicating that the moderating effect of CEO turnover is stronger for firms with CEOs who hold greater power and authority. In an unreported table, we find similar results using the CEO triality dummy (Adams, Almeida, & Ferreira, 2005).¹⁸

¹⁸ *CEO Triality* is an indicator variable that equals one if a CEO is the chairperson on the board and president of the company.

5.7 Alternative measures of firm distress

Finally, we confirm our main findings by employing alternative measures of firm distress. We use the following alternative measures: (1) *Altman Z-Distress Zone*, which is defined as one if the Altman Z-Score is less than 1.81 and zero otherwise¹⁹; (2) *Ind. Adj. Altman Z*, which is defined as Altman Z-Score minus the median of Altman Z-Score of all firms in the same two-digit SIC code; (3) *O-Score*, which is defined in Equation (2)²⁰; (4) *ZM-Score*, which is defined in Equation (3).²¹

Table 8 shows our findings are robust to these alternative measures of firm distress. Taken all together, we conclude that the forced CEO turnover may be regarded as an ex-post damage instrument when firms face high ESG reputational risk.

[Table 8 around here]

5. Conclusion

CEO replacement is an important decision in any organization. In this paper, we identify the novel channel of how a forced CEO turnover alleviates the firm's financial distress. Specifically, we find that equity holders' sensitive responses to the CEO replacement following the negative media coverage over the firm's ESG practices are one of the key drivers behind the mitigation of the subsequent firm's financial distress. Following the negative media coverage over its ESG practices, various stakeholders take disciplinary actions, such as customers' boycotting the firm's products and investors' disinvesting in the firm's equity shares, which may increase financial distress. Meanwhile, shareholders, among other stakeholders, positively respond to the firm's CEO replacement decision afterward. Thus, the deteriorated market value of a firm by the poor

¹⁹ When the Altman Z-Score is less than 1.81, a firm is likely to head toward insolvency in the next two years (Altman, 1968).

²⁰ The higher the probability that firm goes into bankruptcy, the higher the O-Score (Ohlson, 1980).

²¹ The higher the probability that firm goes into bankruptcy, the higher the ZM-Score (Zmijewski, 1984).

ESG reputation practice could be recovered upon the forced CEO turnover. Overall, our results suggest policy implications of forced CEO turnover to manage firm's ESG reputational risk as well as financial distress.

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Table 1. Summary Statistics

This table reports summary statistics for various firm-year-level variables from fiscal years 2007 to 2015. The definitions of the variables are summarized in the Appendix

| <i>Descriptive Statistics</i> | <i>N</i> | <i>Mean</i> | <i>Std. Dev</i> | <i>Q 25</i> | <i>Median</i> | <i>Q 75</i> |
|---|----------|-------------|-----------------|-------------|---------------|-------------|
| <i>Firm Distress Measures</i> | | | | | | |
| Altman Z | 6,429 | 3.603 | 3.563 | 1.697 | 2.851 | 4.472 |
| Altman Z: (WC/TA) | 6,429 | 0.164 | 0.174 | 0.025 | 0.133 | 0.273 |
| Altman Z: (RE/TA) | 6,429 | 0.195 | 0.849 | 0.071 | 0.246 | 0.426 |
| Altman Z: (EBIT/TA) | 6,429 | 0.088 | 0.110 | 0.049 | 0.085 | 0.134 |
| Altman Z: (MVE/TL) | 6,429 | 3.060 | 4.862 | 0.854 | 1.664 | 3.209 |
| Altman Z: (SALES/TA) | 6,429 | 1.020 | 0.783 | 0.494 | 0.822 | 1.320 |
| <i>Alternative Firm Distress Measures</i> | | | | | | |
| Ind. Adj. Altman Z | 6,429 | 0.225 | 2.224 | -0.292 | 0 | 0.401 |
| O Score | 6,242 | -2.067 | 2.001 | -3.110 | -1.928 | -0.978 |
| ZM Score | 6,242 | -1.293 | 1.493 | -2.165 | -1.296 | -0.493 |
| <i>ESG Reputational Risk Measures</i> | | | | | | |
| ESG RRI | 6,429 | 9.378 | 11.62 | 0 | 0 | 19 |
| ESG PEAK RRI | 6,429 | 18.00 | 17.24 | 0 | 22 | 32 |
| Log ESG Total News | 6,429 | 0.908 | 1.288 | 0 | 0 | 1.609 |
| Log High Severity News | 6,429 | 0.067 | 0.387 | 0 | 0 | 0 |
| Log High Reach News | 6,429 | 0.230 | 0.629 | 0 | 0 | 0 |
| Environmental Issue Covered | 6,429 | 0.032 | 0.177 | 0 | 0 | 0 |
| Social Issue Covered | 6,429 | 0.075 | 0.264 | 0 | 0 | 0 |
| Governance Issue Covered | 6,429 | 0.077 | 0.268 | 0 | 0 | 0 |
| <i>Other Primary & Control Variables</i> | | | | | | |
| Forced Turnover | 6,429 | 0.0235 | 0.152 | 0 | 0 | 0 |
| Log Assets | 6,429 | 8.264 | 1.485 | 7.251 | 8.229 | 9.294 |
| Leverage | 6,429 | 0.256 | 0.182 | 0.122 | 0.246 | 0.364 |
| ROA | 6,429 | 0.141 | 0.089 | 0.092 | 0.133 | 0.183 |
| Market to Book | 6,429 | 1.481 | 1.050 | 0.800 | 1.160 | 1.798 |
| Volatility | 6,429 | 0.341 | 0.423 | 0.137 | 0.236 | 0.390 |
| R&D Intensity | 6,429 | 0.019 | 0.037 | 0 | 0 | 0.019 |
| Capital Intensity | 6,429 | 0.054 | 0.052 | 0.021 | 0.039 | 0.069 |
| Cash Holdings | 6,429 | 0.126 | 0.131 | 0.029 | 0.082 | 0.178 |
| Dividend Payer | 6,429 | 0.629 | 0.483 | 0 | 1 | 1 |
| Sales Growth | 6,429 | 0.085 | 0.994 | -0.014 | 0.042 | 0.127 |
| Log Firm Age | 6,429 | 3.386 | 0.622 | 2.944 | 3.401 | 3.970 |
| Institutional Holdings | 6,429 | 0.743 | 0.281 | 0.670 | 0.822 | 0.921 |
| High HHI | 4,344 | 0.551 | 0.497 | 0 | 1 | 1 |
| Sin Industry Firm | 5,390 | 0.093 | 0.291 | 0 | 0 | 0 |
| High Analyst Coverage | 2,826 | 0.627 | 0.484 | 0 | 1 | 1 |
| Climate Risk | 6,188 | 0.548 | 0.498 | 0 | 1 | 1 |

Table 2. ESG Reputation Risk and Firm Distress

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeldt and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable: Altman Z _{<i>t</i>} | | | | | |
|--|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>ESG RRI</i> _{<i>t-1</i>} | -0.015*** (-5.16) | -0.016*** (-5.37) | | | | |
| <i>ESG RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | 0.024*** (2.91) | | | | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} | | | -0.007*** (-3.50) | -0.007*** (-3.75) | | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | | | 0.019*** (3.05) | | |
| <i>Log ESG Total News</i> _{<i>t-1</i>} | | | | | -0.126*** (-5.29) | -0.131*** (-5.46) |
| <i>Log ESG Total News</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | | | | | 0.171** (2.33) |
| <i>Forced Turnover</i> _{<i>t</i>} | | -0.200 (-1.15) | | -0.272 (-1.59) | | -0.110 (-0.65) |
| <i>Log Assets</i> _{<i>t</i>} | -0.743*** (-5.18) | -0.743*** (-5.15) | -0.853*** (-5.78) | -0.857*** (-5.77) | -0.748*** (-5.25) | -0.749*** (-5.24) |
| <i>Log Assets</i> ² _{<i>t</i>} | 0.286*** (3.61) | 0.286*** (3.61) | 0.329*** (4.03) | 0.331*** (4.03) | 0.286*** (3.65) | 0.287*** (3.65) |
| <i>Leverage</i> _{<i>t</i>} | -7.921*** (-22.35) | -7.925*** (-22.32) | -7.903*** (-22.34) | -7.907*** (-22.32) | -7.933*** (-22.30) | -7.936*** (-22.27) |
| <i>ROA</i> _{<i>t</i>} | 4.731*** (6.29) | 4.749*** (6.32) | 4.749*** (6.32) | 4.766*** (6.34) | 4.711*** (6.27) | 4.720*** (6.28) |
| <i>Market to Book</i> _{<i>t</i>} | 1.810*** (16.34) | 1.810*** (16.33) | 1.807*** (16.31) | 1.807*** (16.30) | 1.811*** (16.35) | 1.812*** (16.33) |
| <i>Volatility</i> _{<i>t</i>} | -0.151 (-1.10) | -0.150 (-1.09) | -0.153 (-1.11) | -0.151 (-1.09) | -0.151 (-1.10) | -0.150 (-1.09) |
| <i>R&D Intensity</i> _{<i>t</i>} | -13.723*** (-5.82) | -13.710*** (-5.80) | -13.737*** (-5.81) | -13.744*** (-5.80) | -13.705*** (-5.82) | -13.709*** (-5.81) |
| <i>Capital Intensity</i> _{<i>t</i>} | -0.760 (-1.07) | -0.770 (-1.08) | -0.758 (-1.07) | -0.772 (-1.09) | -0.757 (-1.07) | -0.761 (-1.07) |
| <i>Cash Holdings</i> _{<i>t</i>} | 1.975*** (4.18) | 1.965*** (4.16) | 1.936*** (4.10) | 1.924*** (4.08) | 1.955*** (4.15) | 1.949*** (4.14) |
| <i>Dividend Payer</i> | -0.362*** (-4.40) | -0.363*** (-4.43) | -0.364*** (-4.42) | -0.366*** (-4.46) | -0.359*** (-4.38) | -0.360*** (-4.41) |
| <i>Sales Growth</i> _{<i>t</i>} | -0.004 (-0.12) | -0.004 (-0.12) | -0.003 (-0.09) | -0.003 (-0.09) | -0.004 (-0.11) | -0.004 (-0.12) |
| <i>Log Firm Age</i> _{<i>t</i>} | 0.082* (1.75) | 0.081* (1.73) | 0.079* (1.68) | 0.078* (1.66) | 0.081* (1.72) | 0.080* (1.70) |
| <i>Institutional Holdings</i> _{<i>t</i>} | 0.316** (2.48) | 0.319** (2.50) | 0.328** (2.56) | 0.331*** (2.58) | 0.321** (2.52) | 0.324** (2.54) |
| <i>Constant</i> | 4.179*** (9.88) | 3.873*** (9.83) | 4.158*** (9.82) | 3.788*** (9.55) | 4.203*** (9.87) | 3.819*** (9.59) |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Observations</i> | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 |
| <i>R-squared</i> | 0.6380 | 0.6382 | 0.6374 | 0.6376 | 0.6379 | 0.6380 |

Table 3. Financial Ratios in Altman Z

This table presents results from OLS regressions of five ratios composing Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover. Panel A reports results of regressions using *ESG RRI*. Panel B reports results of regressions using *ESG PEAK RRI*. Panel C reports results of regressions using *Log ESG Total News*. *WC/TA* is the ratio of working capital to total assets. *RE/TA* is the ratio of retained earnings to total assets. *EBIT/TA* is the ratio of earnings before interest and taxes to total assets. *MVE/TL* is the ratio of market value of equity to total liabilities. *SALES/TA* is the ratio of net sales to total assets. *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Panel A | Dependent Variable | | | | |
|---|----------------------|----------------------|----------------------|----------------------|------------------|
| | $(WC/TA)_t$ | $(RE/TA)_t$ | $(EBIT/TA)_t$ | $(MVE/TL)_t$ | $(SALES/TA)_t$ |
| | (1) | (2) | (3) | (4) | (5) |
| <i>Explanatory variables</i> | | | | | |
| <i>ESG RRI</i> _{<i>t-1</i>} | 0.000 (0.45) | -0.005*** (-5.56) | -0.000*** (-4.78) | -0.015*** (-3.52) | 0.002* (1.80) |
| <i>ESG RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | 0.001 (1.01) | 0.002 (0.67) | -0.000 (-0.28) | 0.035*** (2.79) | 0.001 (0.18) |
| <i>Forced Turnover</i> _{<i>t</i>} | -0.030*** (-2.78) | 0.026 (0.46) | -0.001 (-0.11) | -0.417 (-1.63) | 0.052 (0.91) |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Observations</i> | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 |
| <i>R-squared</i> | 0.7309 | 0.2902 | 0.6068 | 0.5986 | 0.5440 |

| Panel B | Dependent Variable | | | | |
|--|----------------------|----------------------|----------------------|---------------------|-----------------|
| | $(WC/TA)_t$ | $(RE/TA)_t$ | $(EBIT/TA)_t$ | $(MVE/TL)_t$ | $(SALES/TA)_t$ |
| | (1) | (2) | (3) | (4) | (5) |
| <i>Explanatory variables</i> | | | | | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} | 0.000 (0.60) | -0.003*** (-5.22) | -0.000*** (-3.60) | -0.006** (-2.14) | 0.001 (1.13) |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | 0.001 (1.08) | 0.001 (0.55) | -0.000 (-0.16) | 0.028*** (2.92) | 0.001 (0.27) |
| <i>Forced Turnover</i> _{<i>t</i>} | -0.031*** (-2.79) | 0.024 (0.41) | -0.002 (-0.23) | -0.520** (-2.01) | 0.049 (0.81) |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Observations</i> | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 |
| <i>R-squared</i> | 0.7309 | 0.2892 | 0.6062 | 0.5983 | 0.5439 |

| Panel C | Dependent Variable | | | | |
|--|----------------------|----------------------|----------------------|----------------------|--------------------|
| | $(WC/TA)_t$ | $(RE/TA)_t$ | $(EBIT/TA)_t$ | $(MVE/TL)_t$ | $(SALES/TA)_t$ |
| | (1) | (2) | (3) | (4) | (5) |
| <i>Explanatory variables</i> | | | | | |
| <i>Log ESG Total News</i> _{<i>t-1</i>} | 0.000 (0.33) | -0.047*** (-5.31) | -0.004*** (-4.91) | -0.117*** (-3.67) | 0.018*** (2.61) |
| <i>Log ESG Total News</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | 0.007 (1.17) | 0.007 (0.33) | 0.000 (0.09) | 0.255** (2.40) | -0.001 (-0.05) |
| <i>Forced Turnover</i> _{<i>t</i>} | -0.029*** (-2.87) | 0.035 (0.66) | -0.002 (-0.38) | -0.293 (-1.17) | 0.060 (1.11) |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes |
| <i>Observations</i> | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 |
| <i>R-squared</i> | 0.6654 | 0.2551 | 0.4033 | 0.5084 | 0.5284 |

Table 4. ESG News Sources

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG news sources interacted with the dummy of forced CEO turnover. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *Log High Severity News* is the natural logarithm of one plus the count of news of high severity news events (*Severity* in *RepRisk*). *Log High reach News* is the natural logarithm of one plus the count of high reach news on ESG issues (e.g., BBC, FT, NY Times, WSJ, etc., *Reach* in *RepRisk*). *Environmental Issue Covered* is an indicator variable that equals one if the firm had at least one negative news article pertaining to its environmental issues during the year. *Social Issue Covered* is an indicator variable that equals one if the firm had at least one negative news article pertaining to its social issues during the year. *Governance Issue Covered* is an indicator variable that equals one if the firm had at least one negative news article pertaining to its governance issues during the year. All measures of ESG news sources are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable: Altman Z _{<i>t</i>} | | | | | | |
|---|--|----------------------|----------------------|---------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| <i>Log High Severity News</i> _{<i>t-1</i>} | -0.225*** (-4.47) | | -0.152*** (-3.01) | | | | |
| <i>Log High Severity News</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | 0.054 (0.29) | | -0.126 (-0.65) | | | | |
| <i>Log High Reach News</i> _{<i>t-1</i>} | | -0.248*** (-5.93) | -0.225*** (-5.31) | | | | |
| <i>Log High Reach News</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | 0.261** (2.04) | 0.273** (2.32) | | | | |
| <i>Environmental Issue Covered</i> _{<i>t-1</i>} | | | | -0.322** (-2.55) | | | -0.162 (-1.25) |
| <i>Environmental Issue Covered</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | | | 1.096*** (3.53) | | | 1.010*** (2.67) |
| <i>Social Issue Covered</i> _{<i>t-1</i>} | | | | | -0.325*** (-3.78) | | -0.243*** (-2.65) |
| <i>Social Issue Covered</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | | | | 0.365 (1.39) | | -0.026 (-0.09) |
| <i>Governance Issue Covered</i> _{<i>t-1</i>} | | | | | | -0.335*** (-3.38) | -0.290*** (-2.92) |
| <i>Governance Issue Covered</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | | | | | 0.601* (1.81) | 0.512* (1.75) |
| <i>Forced Turnover</i> _{<i>t</i>} | 0.042 (0.31) | -0.016 (-0.11) | -0.015 (-0.11) | 0.024 (0.18) | 0.019 (0.13) | -0.020 (-0.14) | -0.023 (-0.15) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects (SIC 2) | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 | 6,429 |
| R-squared | 0.6371 | 0.6378 | 0.6380 | 0.6369 | 0.6371 | 0.6371 | 0.6375 |

Table 5. Endogeneity Tests

This table presents the robustness of the results in Table 2 to the endogeneity issues. Panel A reports results of regressions using *ESG RRI*. Panel B reports results of regressions using *ESG PEAK RRI*. Panel C reports results of regressions using *Log ESG Total News*. Model (1) and (2) report first-stage results. Model (3) reports second-stage results. *Climate Risk* is a dummy variable that equals one if a firm's headquarter is located within a county that is exposed to severe climate change risks (Painter (2020)). *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). All measures of ESG reputational risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeldt and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Panel A | 2SLS | | |
|--|--------------------------------------|--|-------------------------------------|
| | First Stage | | Second Stage |
| | <i>ESG RRI</i> _{<i>t-1</i>} | <i>ESG RRI</i> _{<i>t-1</i>} <i>X Forced Turnover</i> _{<i>t</i>} | <i>Altman Z</i> _{<i>t</i>} |
| <i>Explanatory variables</i> | (1) | (2) | (3) |
| <i>Climate Risk</i> _{<i>t-1</i>} | 0.571*** (2.72) | 0.044 (1.27) | |
| <i>Forced Turnover</i> _{<i>t</i>} | 4.026*** (3.74) | 15.09*** (7.55) | 0.119 (0.82) |
| <i>Climate Risk</i> _{<i>t-1</i>} <i>X Forced Turnover</i> _{<i>t</i>} | -2.865** (-2.10) | -5.363** (-2.32) | |
| Predicted (<i>ESG RRI</i>) | | | -0.148*** (-3.83) |
| Predicted (<i>ESG RRI X Forced Turnover</i>) | | | 0.029** (1.97) |
| <i>Controls</i> | Yes | Yes | Yes |
| <i>Industry fixed effect</i> | Yes | Yes | Yes |
| <i>Year fixed effect</i> | Yes | Yes | Yes |
| <i>Observations</i> | 6,257 | 6,243 | 5,835 |
| <i>R-squared</i> | 0.495 | 0.460 | 0.652 |
| <i>Prob > F</i> | 0.000 | 0.000 | |

| Panel B | 2SLS | | |
|--|---|---|-------------------------------------|
| | First Stage | | Second Stage |
| | <i>ESG PEAK RRI</i> _{<i>t-1</i>} | <i>ESG PEAK RRI</i> _{<i>t-1</i>} <i>X Forced Turnover</i> _{<i>t</i>} | <i>Altman Z</i> _{<i>t</i>} |
| <i>Explanatory variables</i> | (1) | (2) | (3) |
| <i>Climate Risk</i> _{<i>t-1</i>} | 0.976*** (2.69) | 0.094** (1.98) | |
| <i>Forced Turnover</i> _{<i>t</i>} | 6.869*** (3.85) | 25.034*** (9.45) | 0.118 (0.83) |
| <i>Climate Risk</i> _{<i>t-1</i>} <i>X Forced Turnover</i> _{<i>t</i>} | -5.897*** (2.60) | -5.982* (-1.91) | |
| Predicted (<i>ESG PEAK RRI</i>) | | | -0.112*** (-3.79) |
| Predicted (<i>ESG PEAK RRI X Forced Turnover</i>) | | | 0.018* (1.94) |
| <i>Controls</i> | Yes | Yes | Yes |
| <i>Industry fixed effect</i> | Yes | Yes | Yes |
| <i>Year fixed effect</i> | Yes | Yes | Yes |
| <i>Observations</i> | 6,257 | 6,243 | 5,835 |
| <i>R-squared</i> | 0.445 | 0.585 | 0.652 |
| <i>Prob > F</i> | 0.000 | 0.000 | |

Table 5. cont.

| Panel C | 2SLS | | |
|---|---|---|-----------------------------|
| | First Stage | | Second Stage |
| | <i>Log ESG Total News_{t-1}</i> | <i>Log ESG Total News_{t-1} X Forced Turnover_t</i> | <i>Altman Z_t</i> |
| <i>Explanatory variables</i> | (1) | (2) | (3) |
| <i>Climate Risk_{t-1}</i> | 0.082*** (3.04) | 0.004 (1.19) | |
| <i>Forced Turnover_t</i> | 0.375*** (2.71) | 1.315*** (6.23) | 0.120 (0.83) |
| <i>Climate Risk_{t-1} X Forced Turnover_t</i> | -0.286* (-1.70) | -0.483** (-1.96) | |
| <i>Predicted (Log ESG Total News)</i> | | | -1.210*** (-3.79) |
| <i>Predicted (Log ESG Total News X Forced Turnover)</i> | | | 0.253** (2.10) |
| <i>Controls</i> | Yes | Yes | Yes |
| <i>Industry fixed effect</i> | Yes | Yes | Yes |
| <i>Year fixed effect</i> | Yes | Yes | Yes |
| <i>Observations</i> | 6,257 | 6,243 | 5,835 |
| <i>R-squared</i> | 0.488 | 0.359 | 0.651 |
| <i>Prob > F</i> | 0.000 | 0.000 | |

Table 6. Market Concentration, Sin Industry, and Analyst Coverage

This table presents results from sub-sample of firms under various external environments. In Models (1) and (2), we partition the sample into terciles based on the level of market concentration (Herfindahl Index). Herfindahl Index (*HHI*) is based on annual sales in each four-digit SIC industry code. In Models (3) and (4) we partition the sample by the dummy variable that equals one if a firm is within the sin stock industry (Alcohol, Gaming, and Tobacco) and zero otherwise (Hong and Kacperczyk (2009)). In Models (5) and (6) we partition the sample into terciles based on analyst coverage. The dependent variable is *Altman Z*. All measures of ESG news sources are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Panel A | Market Concentration (<i>HHI</i>) | | Sin Industry Firm | | Analyst Coverage | |
|---|-------------------------------------|-------------------------|--------------------|----------------------|----------------------|-------------------------|
| | 1 | 0 | 1 | 0 | 1 | 0 |
| | (Top Tercile) (1) | (Bottom Tercile) (2) | (3) | (4) | (Top Tercile) (5) | (Bottom Tercile) (6) |
| <i>ESG RRI_{t-1}</i> | -0.018*** (-5.58) | -0.020*** (-2.90) | -0.009* (-1.86) | -0.013*** (-4.32) | -0.018*** (-3.28) | -0.020** (-2.11) |
| <i>ESG RRI_{t-1} X Forced Turnover_t</i> | 0.026** (2.54) | 0.003 (0.16) | 0.035** (2.05) | 0.020** (2.32) | 0.023** (2.05) | 0.008 (0.25) |
| <i>Forced Turnover_t</i> | -0.471** (-2.09) | 0.325 (0.76) | -0.623 (-1.53) | -0.184 (-0.94) | -0.095 (-0.30) | -0.294 (-0.69) |
| <i>Observations</i> | 2,403 | 1,941 | 503 | 4,887 | 1,788 | 1,038 |
| <i>Chow Test</i> | <i>P-value</i> | | <i>P-value</i> | | <i>P-value</i> | |
| $\beta_1(ESG RRI_{t-1}) +$ | < 0.05 | | < 0.05 | | < 0.05 | |
| $\beta_2(ESG RRI_{t-1} X Forced Turnover_t)$ | | | | | | |
| Panel B | Market Concentration (<i>HHI</i>) | | Sin Industry Firm | | Analyst Coverage | |
| | 1 | 0 | 1 | 0 | 1 | 0 |
| | (Top Tercile) (1) | (Bottom Tercile) (2) | (3) | (4) | (Top Tercile) (5) | (Bottom Tercile) (6) |
| <i>ESG PEAK RRI_{t-1}</i> | -0.012*** (-5.62) | -0.009* (-1.95) | -0.006 (-1.49) | -0.006*** (-3.23) | -0.008** (-2.33) | -0.007 (-1.19) |
| <i>ESG PEAK RRI_{t-1} X Forced Turnover_t</i> | 0.016** (2.10) | 0.009 (0.57) | 0.033** (2.35) | 0.017** (2.52) | 0.011 (1.10) | 0.001 (0.02) |
| <i>Forced Turnover_t</i> | -0.459** (-1.97) | 0.187 (0.45) | -0.864* (-1.85) | -0.259 (-1.37) | -0.019 (-0.06) | -0.281 (-0.65) |
| <i>Observations</i> | 2,403 | 1,941 | 503 | 4,887 | 1,788 | 1,038 |
| <i>Chow Test</i> | <i>P-value</i> | | <i>P-value</i> | | <i>P-value</i> | |
| $\beta_1(ESG PEAK RRI_{t-1}) +$ | < 0.01 | | < 0.05 | | < 0.1 | |
| $\beta_2(ESG PEAK RRI_{t-1} X Forced Turnover_t)$ | | | | | | |

Table 6. cont.

| Panel C | Market Concentration (HHI) | | Sin Industry Firm | | Analyst Coverage | |
|---|----------------------------|----------------------|--------------------|----------------------|----------------------|--------------------|
| | 1 | 0 | 1 | 0 | 1 | 0 |
| | (Top Tercile) | (Bottom Tercile) | | | (Top Tercile) | (Bottom Tercile) |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>Log ESG Total News_{t-1}</i> | -0.113*** (-4.26) | -0.185*** (-3.39) | -0.008 (-0.16) | -0.120*** (-4.59) | -0.141*** (-3.41) | -0.151* (-1.78) |
| <i>Log ESG Total News_{t-1} X Forced Turnover_t</i> | 0.172* (1.89) | 0.077 (0.45) | 0.322** (2.50) | 0.143* (1.87) | 0.208* (1.77) | 0.132 (0.45) |
| <i>Forced Turnover_t</i> | -0.360 (-1.63) | 0.275 (0.72) | -0.547* (-1.67) | -0.112 (-0.58) | -0.064 (-0.22) | -0.335 (-0.79) |
| <i>Observations</i> | 2,403 | 1,941 | 503 | 4,887 | 1,788 | 1,038 |
| <i>Chow Test</i> | <i>P-value</i> | | <i>P-value</i> | | <i>P-value</i> | |
| <i>β₁(Log ESG Total News_{t-1}) +</i> | <i>< 0.1</i> | | <i>< 0.05</i> | | <i>< 0.1</i> | |
| <i>β₂(Log ESG Total News_{t-1} X Forced Turnover))</i> | | | | | | |

Table 7. Termination of CEO serving as Board Chair

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover and the dummy of CEO duality. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). *CEO Duality* is an indicator variable that equals one if a CEO is the chairperson on the board. The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable: Altman Z _{<i>t</i>} | | |
|---|--|---------------------|----------------------|
| | (1) | (2) | (3) |
| <i>ESG RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | 0.013* (1.74) | | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | 0.014** (1.96) | |
| <i>Log ESG Total News</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} | | | 0.161* (1.87) |
| <i>ESG RRI</i> _{<i>t-1</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | -0.002 (-0.52) | | |
| <i>ESG RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | 0.038** (2.10) | | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | | -0.003 (-0.86) | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | | 0.021** (1.99) | |
| <i>Log ESG Total News</i> _{<i>t-1</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | | | -0.018 (-0.52) |
| <i>Log ESG Total News</i> _{<i>t-1</i>} X <i>Forced Turnover</i> _{<i>t</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | | | 0.025* (1.71) |
| <i>Forced Turnover</i> _{<i>t</i>} X <i>CEO Duality</i> _{<i>t-1</i>} | -0.683** (-2.02) | -0.587* (-1.73) | -0.247 (-0.66) |
| <i>ESG RRI</i> _{<i>t-1</i>} | -0.014*** (-3.88) | | |
| <i>ESG PEAK RRI</i> _{<i>t-1</i>} | | -0.006** (-2.33) | |
| <i>Log ESG Total News</i> _{<i>t-1</i>} | | | -0.122*** (-4.20) |
| <i>CEO Duality</i> _{<i>t-1</i>} | -0.077 (-1.01) | -0.055 (-0.67) | -0.081 (-1.13) |
| <i>Forced Turnover</i> _{<i>t</i>} | -0.021 (-0.10) | -0.139 (-0.68) | -0.046 (-0.23) |
| <i>Controls</i> | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes |
| <i>Observations</i> | 6,417 | 6,417 | 6,417 |
| <i>R-squared</i> | 0.6404 | 0.6399 | 0.6403 |

Table 8. Alternative Measures: Firm Distress

This table presents results from regressions of alternative measures of firm distress on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover and the dummy of CEO duality. Models (1)-(3) report results from Logit model. Models (4)-(12) report results from OLS regressions. *Altman Z-Distress Zone* is a dummy variable that equals one if Altman Z-Score is less than 1.81 and zero otherwise. When Altman Z-Score is less than 1.81, a firm is likely to head toward insolvency in the next two years (Altman (1968)). *Ind Adj. Altman Z* is Altman Z-Score minus the median of Altman Z-Score of all firms in the same two-digit SIC code. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *O-Score* is constructed following Ohlson (1980) as in Equation (2). The higher the probability that firm goes into bankruptcy, the higher *O-Score*. *ZM-Score* is constructed following Zmijewski (1984) as in Equation (3). The higher the probability that firm goes into bankruptcy, the higher *ZM-Score*. *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable | | | | | | | | | | | |
|--|------------------------|----------|----------|---------------------------------|----------|-----------|----------------------|-----------|-----------|-----------------------|-----------|-----------|
| | Altman Z-Distress Zone | | | Ind. Adj. Altman Z _t | | | O-Score _t | | | ZM-Score _t | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| <i>ESG RRI</i> _{t-1} | 0.012* | | | -0.009*** | | | 0.014*** | | | 0.013*** | | |
| | (1.89) | | | (-3.50) | | | (7.07) | | | (8.07) | | |
| <i>ESG RRI</i> _{t-1} X <i>Forced Turnover</i> _t | -0.053*** | | | 0.009** | | | -0.021*** | | | -0.020*** | | |
| | (-2.74) | | | (1.97) | | | (-2.80) | | | (-3.02) | | |
| <i>ESG PEAK RRI</i> _{t-1} | | 0.006 | | | -0.004** | | | 0.008*** | | | 0.007*** | |
| | | (1.59) | | | (-2.47) | | | (5.72) | | | (7.07) | |
| <i>ESG PEAK RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | -0.031** | | | 0.009** | | | -0.018*** | | | -0.016*** | |
| | | (-2.10) | | | (1.99) | | | (-3.10) | | | (-3.35) | |
| <i>Log ESG Total News</i> _{t-1} | | | 0.078 | | | -0.069*** | | | 0.124*** | | | 0.115*** |
| | | | (1.45) | | | (-3.55) | | | (7.41) | | | (8.43) |
| <i>Log ESG Total News</i> _{t-1} X <i>Forced Turnover</i> _t | | | -0.298** | | | 0.047* | | | -0.186*** | | | -0.172*** |
| | | | (-1.99) | | | (1.81) | | | (-2.91) | | | (-3.18) |
| <i>Forced Turnover</i> _t | 0.686* | 0.635 | 0.393 | -0.187 | -0.247* | -0.137 | 0.421*** | 0.496*** | 0.376*** | 0.438*** | 0.499*** | 0.395*** |
| | (1.80) | (1.64) | (1.05) | (-1.29) | (-1.71) | (-0.92) | (2.84) | (3.24) | (2.82) | | | |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Observations</i> | 6,047 | 6,047 | 6,047 | 6,429 | 6,429 | 6,429 | 6,242 | 6,242 | 6,242 | 6,242 | 6,242 | 6,242 |
| <i>R-squared/Pseudo</i> | 0.620 | 0.619 | 0.619 | 0.1933 | 0.1928 | 0.1932 | 0.6075 | 0.6068 | 0.6076 | 0.6660 | 0.6652 | 0.6662 |

Appendix of
“The Effect of ESG-motivated Turnover on Firm Financial Risk
”

Appendix: Variable Definitions

| <i>Variable</i> | <i>Definition</i> |
|------------------------------------|--|
| <i>Altman Z</i> | $1.2 \times (\text{Working Capital}/\text{Total Assets}) + 1.4 \times (\text{Retained Earnings}/\text{Total Assets}) + 3.3 \times (\text{EBIT}/\text{Total Assets}) + 0.6 \times (\text{Market Value of Equity}/\text{Total Liabilities}) + 0.99 \times (\text{Net Sales}/\text{Total Assets})$. |
| <i>Ind. Adj. Altman Z</i> | Altman Z-Score minus the median of Altman Z-Score of all firms in the same two-digit SIC code |
| <i>Altman Z-Distress Zone</i> | Indicator variable that equals one if Altman Z-Score is less than 1.81 and zero otherwise |
| <i>O Score</i> | $-1.32 - 0.407 \times \log(\text{Total Assets}/\text{GNP}) + 6.03 \times (\text{Total Liabilities}/\text{Total Assets}) - 1.43 \times (\text{Working Capital}/\text{Total Assets}) + 0.0757 \times (\text{Current Liabilities}/\text{Current Assets}) - 1.72 \times (1 \text{ if } \text{Total Liabilities} > \text{Total Assets}, 0 \text{ otherwise}) - 2.37 \times (\text{Net Income}/\text{Total Assets}) - 1.83 \times (\text{Funds from Operations}/\text{Total Liabilities}) + 0.285 \times (1 \text{ if a net loss for the last two years}, 0 \text{ otherwise}) - 0.521 \times [(\text{Net Income} - \text{last year Net Income})/(\text{Net Income} + \text{last year Net Income})]$. |
| <i>ZM Score</i> | $-4.336 - 4.513 \times (\text{Net Income}/\text{Total Assets}) + 5.679 \times (\text{Total Liabilities}/\text{Total Assets}) + 0.004 \times (\text{Current Assets}/\text{Current Liabilities})$. |
| <i>ESG RRI</i> | Firm's total reputational risk index (current RRI in RepRisk database) for the fiscal year divided by 12. |
| <i>ESG PEAK RRI</i> | Firm's highest level of reputational risk index (PEAK RRI in RepRisk database) for the trailing 24 months. |
| <i>Log ESG Total News</i> | Log (1+ total ESG news count of a firm for the fiscal year). |
| <i>Log High Severity News</i> | Log (1+ count of news of high severity news events (Severity in RepRisk)). |
| <i>Log High Reach News</i> | Log (1+ count of high reach news on ESG issues (e.g., BBC, FT, NY Times, WSJ, etc., Reach in RepRisk)). |
| <i>Environmental Issue Covered</i> | Indicator variable that equals one if the firm had at least one negative news article pertaining to its environmental issues during the year. |
| <i>Social Issue Covered</i> | Indicator variable that equals one if the firm had at least one negative news article pertaining to its social issues during the year. |
| <i>Governance Issue Covered</i> | Indicator variable that equals one if the firm had at least one negative news article pertaining to its governance issues during the year. |
| <i>Forced Turnover</i> | Indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)) |
| <i>Log Assets</i> | Log (total assets) |
| <i>Leverage</i> | Book leverage |
| <i>ROA</i> | Ratio of earnings before interests, taxes, and depreciation to the firm's total assets |
| <i>Market to Book</i> | $(\text{Market value of common stock} + \text{total debt} + \text{preferred stock} - \text{deferred taxes and investment tax credit}) / \text{total assets}$ |
| <i>Volatility</i> | Standard deviation of daily stock return for 36 months |
| <i>R&D Intensity</i> | Research and Development (Max (xrd, 0)) divided by total assets. |
| <i>Capital Intensity</i> | Capital expenditure (subtracting Sale of Property, Plant and Equipment) divided by total assets. |
| <i>Cash Holdings</i> | Ratio of year-end cash and cash equivalent over total assets |

| | |
|-------------------------------|---|
| <i>Dividend Payer</i> | Indicator variable that equals one if the firm's dividend is greater than zero in the fiscal year |
| <i>Sales Growth</i> | $(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$ |
| <i>Log Firm Age</i> | Log (Age since the IPO in years measured at the end of fiscal year) |
| <i>Institutional Holdings</i> | Percent ownership from institutions |
| <i>CEO Duality</i> | Indicator variable that equals one if a CEO is the chairperson on the board. |
| <i>HHI</i> | Herfindahl index based on annual sales in each four-digit SIC industry code. |
| <i>Sin Industry Firm</i> | Indicator variable that equals one if a firm is within the sin stock industry (Alcohol, Gaming, and Tobacco). |
| <i>Analyst Coverage</i> | Analyst coverage during the fiscal year |
| <i>Climate Risk</i> | Indicator variable that equals one if a firm's headquarter is located within a county that is exposed to severe climate change risks (Painter (2020)). |
| <i>Voluntary Turnover</i> | Indicator variable that equals one if the CEO departure is classified as non-forced. |
| <i>CSR (KLD)</i> | Sum of strength scores for community, diversity, environment, product, employee relation, and human rights components minus the sum of concern scores for community, diversity, environment, product, employee relation, and human rights components. |

Table A.1. One Year Ahead Altman Z

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). All independent variables are lagged one year. The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable: Altman Z _{t+1} | | | | | |
|--|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>ESG RRI</i> _{t-1} | -0.010*** (-3.13) | -0.011*** (-3.35) | | | | |
| <i>ESG RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | 0.020* (1.91) | | | | |
| <i>ESG PEAK RRI</i> _{t-1} | | | -0.006*** (-2.58) | -0.006*** (-2.81) | | |
| <i>ESG PEAK RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | | | 0.016** (1.96) | | |
| <i>Log ESG Total News</i> _{t-1} | | | | | -0.086*** (-3.01) | -0.091*** (-3.17) |
| <i>Log ESG Total News</i> _{t-1} X <i>Forced Turnover</i> _t | | | | | | 0.157* (1.73) |
| <i>Forced Turnover</i> _t | | 0.020 (0.08) | | -0.045 (-0.18) | | 0.080 (0.34) |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 6,178 | 6,178 | 6,178 | 6,178 | 6,178 | 6,178 |
| R-squared | 0.5373 | 0.5375 | 0.5372 | 0.5374 | 0.5373 | 0.5374 |

Table A.2. Voluntary CEO Turnover

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Voluntary Turnover* is an indicator variable that equals one if the CEO departure is classified as non-forced. The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable: <i>Altman Z_t</i> | | |
|--|---|----------------------|----------------------|
| | (2) | (4) | (6) |
| <i>ESG RRI_{t-1}</i> | -0.017*** (-5.38) | | |
| <i>ESG RRI_{t-1} X Voluntary Turnover_t</i> | 0.011* (1.83) | | |
| <i>ESG PEAK RRI_{t-1}</i> | | -0.008*** (-3.71) | |
| <i>ESG PEAK RRI_{t-1} X Voluntary Turnover_t</i> | | 0.007 (1.63) | |
| <i>Log ESG Total News_{t-1}</i> | | | -0.138*** (-5.62) |
| <i>Log ESG Total News_{t-1} X Voluntary Turnover_t</i> | | | 0.104* (1.85) |
| <i>Voluntary Turnover_t</i> | -0.179* (-1.79) | -0.185* (-1.77) | -0.165* (-1.86) |
| <i>Controls</i> | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes |
| <i>Observations</i> | 6,429 | 6,429 | 6,429 |

Table A.3. Sub-Sample Analysis

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover. Panel A reports the results from the sub sample which includes sample in the post 2008 financial crisis periods (2009-2015). Panel B reports the results from the sub sample which exclude firms within Oil and Gas industries. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Panel A. Sample after 2008 Financial Crisis | | Dependent Variable: Altman Z _t | | | | |
|--|----------------------|---|----------------------|----------------------|----------------------|----------------------|
| Explanatory variables | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>ESG RRI</i> _{t-1} | -0.014*** (-3.97) | -0.015*** (-4.20) | | | | |
| <i>ESG RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | 0.024*** (2.78) | | | | |
| <i>ESG PEAK RRI</i> _{t-1} | | | -0.006*** (-2.62) | -0.007*** (-2.86) | | |
| <i>ESG PEAK RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | | | 0.019*** (2.92) | | |
| <i>Log ESG Total News</i> _{t-1} | | | | | -0.119*** (-4.27) | -0.124*** (-4.43) |
| <i>Log ESG Total News</i> _{t-1} X <i>Forced Turnover</i> _t | | | | | | 0.150* (1.93) |
| <i>Forced Turnover</i> _t | | -0.256 (-1.28) | | -0.331* (-1.72) | | -0.122 (-0.62) |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,825 | 4,825 | 4,825 | 4,825 | 4,825 | 4,825 |
| R-squared | 0.6491 | 0.6493 | 0.6486 | 0.6488 | 0.6491 | 0.6492 |

| Panel B. Sample excluding Oil & Gas Industry Firms | | Dependent Variable: Altman Z _t | | | | |
|--|----------------------|---|----------------------|----------------------|----------------------|----------------------|
| Explanatory variables | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>ESG RRI</i> _{t-1} | -0.017*** (-5.29) | -0.018*** (-5.52) | | | | |
| <i>ESG RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | 0.026*** (3.06) | | | | |
| <i>ESG PEAK RRI</i> _{t-1} | | | -0.007*** (-3.59) | -0.008*** (-3.85) | | |
| <i>ESG PEAK RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | | | 0.021*** (3.17) | | |
| <i>Log ESG Total News</i> _{t-1} | | | | | -0.145*** (-5.63) | -0.151*** (-5.81) |
| <i>Log ESG Total News</i> _{t-1} X <i>Forced Turnover</i> _t | | | | | | 0.196** (2.54) |
| <i>Forced Turnover</i> _t | | -0.197 (-1.11) | | -0.270 (-1.54) | | -0.104 (-0.60) |
| <i>Controls</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 6,081 | 6,081 | 6,081 | 6,081 | 6,081 | 6,081 |
| R-squared | 0.6332 | 0.6335 | 0.6326 | 0.6329 | 0.6332 | 0.6334 |

Table A.4. CSR

This table presents results from OLS regressions of Altman Z-Score on the various measure of ESG reputation risk interacted with the dummy of forced CEO turnover. *Altman Z* measures the likelihood of bankruptcy of a firm and computed as in Equation (1). The higher the probability that firm goes into bankruptcy, the lower Altman Z-Score (Altman (1968)). *ESG RRI* is a firm's total reputational risk index (current RRI in *RepRisk* database) for the fiscal year divided by 12. *ESG PEAK RRI* is a firm's highest level of reputational risk index (PEAK RRI in *RepRisk* database) for the trailing 24 months. *Log ESG Total News* is the natural logarithm of one plus the total ESG news count of a firm for the fiscal year. All measures of reputation risk are lagged one year to capture the given negative media coverage of ESG practices before the CEO turnover. *Forced CEO Turnover* is an indicator variable that equals one if the CEO departure is classified as forced (Eisfeld and Kuhnen (2013), Peters Wagner (2014), and Gentry, Harrison, Quigley, and Boivie (2021)). *CSR (KLD)* is the sum of strength scores for community, diversity, environment, product, employee relation, and human rights components minus the sum of concern scores for community, diversity, environment, product, employee relation, and human rights components. The definitions of the variables used in the regressions are summarized in the Appendix. In all models, year and two-digit SIC industry fixed effects are included. Standard errors are robust and clustered by firm, and t-statistics are shown in parentheses beneath the coefficients. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

| Explanatory variables | Dependent Variable: Altman Z _t | | |
|--|---|----------------------|----------------------|
| | (1) | (2) | (3) |
| <i>ESG RRI</i> _{t-1} | -0.015*** (-4.26) | | |
| <i>ESG RRI</i> _{t-1} X <i>Forced Turnover</i> _t | 0.032*** (3.27) | | |
| <i>ESG RRI</i> _{t-1} X <i>CSR (KLD)</i> _t | 0.001* (1.68) | | |
| <i>ESG PEAK RRI</i> _{t-1} | | -0.007*** (-3.13) | |
| <i>ESG PEAK RRI</i> _{t-1} X <i>Forced Turnover</i> _t | | 0.026*** (3.37) | |
| <i>ESG PEAK RRI</i> _{t-1} X <i>CSR (KLD)</i> _t | | 0.001* (1.76) | |
| <i>Log ESG Total News</i> _{t-1} | | | -0.137*** (-4.48) |
| <i>Log ESG Total News</i> _{t-1} X <i>Forced Turnover</i> _t | | | 0.320*** (3.50) |
| <i>Log ESG Total News</i> _{t-1} X <i>CSR (KLD)</i> _t | | | 0.009* (1.84) |
| <i>CSR (KLD)</i> _t | -0.029* (-1.80) | -0.029 (-1.55) | -0.026 (-1.64) |
| <i>Forced Turnover</i> _t | -0.313 (-1.54) | -0.437** (-2.15) | -0.305 (-1.55) |
| <i>Controls</i> | Yes | Yes | Yes |
| <i>Industry Fixed Effects (SIC 2)</i> | Yes | Yes | Yes |
| <i>Year Fixed Effects</i> | Yes | Yes | Yes |
| Observations | 4,297 | 4,297 | 4,297 |
| R-squared | 0.6606 | 0.6603 | 0.6605 |