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LEARNING FROM PEERS: INFORMATION SPILLOVER ON ESG
INVESTMENT

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Learning from Peers: Information Spillover on ESG Investment

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Learning from Peers: Information Spillover on ESG Investment

Abstract

I examine whether the adverse ESG incidents of industry peers affect focal firms' ESG investment. When firms' industry peers suffer from adverse ESG incidents, the focal firms perceive the risk to themselves through information spillover and are expected to take proactive actions such as making ESG investment to prevent potential damage. I exploit ESG-related job postings as the proxy for ESG investment because setting up job positions and hiring employees is an important investment decision for a firm. I find that firms increase ESG investment after their industry peers are exposed to negative ESG incidents. This relation is stronger when: (1) their peers share high similarity with focal firms, (2) the peers and the focal firms are commonly held by eco-conscious investors, or the focal firms are stakeholder oriented, (3) the peer firms are more transparent in ESG. Consequently, I find a decline in focal firms' greenhouse gas emissions and the mitigation of their climate change risk following the increase in ESG investment triggered by peers' negative incidents. Overall, I contribute to the information spillover literature that firms appear to learn important knowledge from their peers' adverse ESG incidents and manage the potential risk by investing in ESG human capital.

1 Introduction

Firms within the same industry share similar products and manufacturing processes, require comparable resources, and face common consumer behavior trends, competing against, coexisting and prospering with peers (DiMaggio and Powell 1983). Because decision-making in uncertainty can be costly, monitoring peer information in reference groups helps firms update and understand ambiguous contexts and make meaningful strategic choices (Peteraf and Shanley 1997; Lee and Pennings 2002), shaping the prescription that may guide managers in identifying problems and seeking solutions (Lord and Foti 1986; Harris 1994). Therefore, firms operate in a complex network of interdependent relationships, and the negative incidents of one firm alter the opportunities and challenges faced by other firms in the same network, which can have a significant influence on their own strategic choices (Ashraf 2022). The knowledge, insights, or signals generated by negative incidents experienced by peers can be a lesson learned by firms in the same industry, shaping how they allocate resources, pursue opportunities, and manage risks. The rational processing of information acquired from others is social learning (Bikhchandani et al. 1998). Firms seek external knowledge to enhance their decisions, recognizing the value of insights coming from beyond their own boundaries (Zucker 1991). Firms can learn from the experiences of their peers by observing, digesting, and internalizing the valuable knowledge passed through the industry network. When peer firms' initiatives succeed, other firms may seek to imitate or adapt similar strategies to improve their competitive position. Conversely, if peer firms experience challenges or adverse incidents in certain areas, a signal is conveyed that there may be potential risks threatening the future development of other firms' operations in the industry so that they may adjust their strategies accordingly to enhance the performance in related areas and manage the unknown risks, avoiding falling into similar pitfalls.

Adverse events experienced by peer firms can affect consumer confidence, investor sentiment, regulatory scrutiny, and operational efficiency for the whole industry, posing a great threat to the firms in the same industry network (focal firms). For example, after Volkswagen admitted to cheating on diesel emissions tests in September 2015, consumers began to question the environmental integrity of other automakers. Regulators around the world increased their scrutiny of emissions testing procedures, resulting in stricter regulatory and compliance requirements for all manufacturers. The fallout from the scandal has prompted other automakers to invest heavily in electric vehicle technology and cleaner emissions technologies to restore consumer trust and comply with stricter regulations.¹ Besides, the literature documents that industry peers of firms that have suffered cyber attacks also experience negative cumulative abnormal returns, indicating that cyber attacks of one firm may expose industry-level cyber risks (Kamiya et al. 2021). It can be seen that in the complex industry ecosystem, firms are interconnected and interdependent; thus, active risk management and strategic adjustment through social learning are quite common and important to maintain the stability and sustainability of the focal firms.

In this paper, I examine how adverse ESG incidents of industry peers affect focal firms' ESG investment. This investigation is important because the necessity of ESG investment in this research context is not solely determined by higher rates of return that it may turn into but by the actions of peer firms and the risk perception formed under pressure. Because firms are in the same industry and face similar market environments and stakeholders, when ESG incidents happen to industry peers, industry-wide risks and vulnerabilities can be observed by other firms. They

¹ <https://www.independent.co.uk/climate-change/news/volkswagen-emissions-scandal-more-carmakers-implicated-as-tests-reveal-pollution-levels-of-popular-diesels-a6674386.html>

perceive the threats to themselves vigilantly and take proactive actions to mitigate the risk, which may include investment actions such as making ESG human capital investments. Therefore, I hypothesize that focal firms increase their investment in ESG, which in the context of this study is an increase in ESG-related job postings after their industry peers experience negative ESG incidents.

Firms' ESG investment is difficult to measure exactly for two reasons: first, due to the lack of standard reporting or disclosure about such investment (Grewal and Serafeim 2020; Yu et al. 2020), and second, because firms may selectively engage in some observable (Wu et al. 2020) or symbolic ESG investment (Basu et al. 2022) for greenwashing rather than substantive ESG investment activities (Walker and Wan 2012). To overcome this challenge, I empirically exploit ESG-related job posts as the proxy for ESG investment because setting up job positions and hiring employees is an important part of ESG investment decisions for a firm and is highly correlated with the overall investment.

I compile detailed information on ESG negative incidents spanning fiscal years 2008 to 2020 provided in Reprisk database. Reprisk aggregates data from a wide range of reputable sources, including news articles, government reports, NGO publications, regulatory filings, and social media posts. By collecting data from diverse sources, the database provides a comprehensive and reliable source of information on ESG-related incidents. For the negative events each month of peer firms identified by 2-digit SIC codes, I check the ESG-related job postings of the focal firm within a 12-month period after peers' incidents, aggregate to the annual level, and analyze using the Logit model. I find that whether the focal firms provide ESG-related job postings is positively related to the number of peer firms that incur negative ESG incidents. The positive relation remains consistent when checking focal firms' ESG-related job postings within a 6-month and 9-month

period. The result also holds when I change the model design. Specifically, I check the relation between the average number of peer firms' negative ESG incidents and the number of ESG-related job postings created in the focal firms within a 12-month period using the Poisson model. I find a consistent positive relation between peers' negative ESG events and focal firms' ESG investment.

I next provide several cross-sectional analyses. First, I consider the similarity between peer firms and focal firms in two aspects: product similarity and financial statement similarity. A high product similarity score between two firms suggests that they offer similar products or services and target similar customer segments or markets. This indicates direct competition for market share and customers. Firms carefully observe their competitors in the product market. By monitoring their competitors, firms can refine their strategies, leverage competitive advantages, address weaknesses, and effectively respond to market challenges. The financial statement is an important channel for public learning since it is a great source of useful information. Financial statement similarity means the comparability of financial reporting. For peer firms that are more comparable, managers can use more industry-wide information with less effort, reducing decision-making costs and completing investment decisions in a shorter time. Therefore, the negative ESG events of peers sharing a higher similarity are expected to trigger more pronounced actions of focal firms.

Second, governance from stakeholders is a crucial part of a firm's decision-making in ESG. Stakeholders, including customers, employees, investors, regulators, and communities, increasingly expect firms to operate in a responsible and sustainable manner. Institutional investors widely consider ESG when managing their portfolios (Hoepner et al. 2024; Gibson-Brandon and Krueger 2018). The preference for green portfolios varies widely across 13-F filing institutions. In particular, the growing green holding trend is being driven by large institutions, especially

BlackRock, Vanguard, and Statestreet, which are considered more eco-conscious (Pastor et al. 2023). The Big Three engage in ESG issues out of altruism and concern for climate risk (Azar et al. 2021). Large institutions are seen as a catalyst for firms to go green (Andersson et al. 2016). Consistently, being held by common eco-conscious investors reinforces the oversight pressure of tackling ESG risks for the focal firms. Besides, stakeholder orientation holds great implications for firms' ESG investments because it fosters long-run vision and global thinking. Therefore, firms that share common Big Three investors with their peers and firms that are stakeholder orientated respond more pronouncedly to peers' negative ESG events by increasing investment in ESG.

Third, ESG reports reduce information asymmetry (Truong et al. 2021; Krueger et al. 2024) and overall industry uncertainty (Badertscher et al. 2013) related to ESG by providing detailed information on the incidents and other ESG activities, as well as valuable insights into peer firms' current efforts and deficiencies, investment levels, financial fundamentals, and future strategic actions in ESG aspects, reducing the information searching cost and helping managers in focal firms gain supplemental knowledge relevant to their decisions on the investment in ESG and make wiser decisions in a lower cost. Consistently, the increase in ESG-related job postings of focal firms is more pronounced for negative ESG incidents of peers that issue ESG reports.

To further confirm focal firms' learning behavior, I consider the objective of focal firms' learning to reduce the similar risk for their own. If this inference holds and firms' social learning is rational, the result of learning should be more efforts put into ESG and a decline in relevant risk. Climate risk is considered a long-term risk (Bansal et al. 2017) and has a wide impact, such as firm value (Brinkman et al. 2008), the stranding of assets (Litterman 2013), and corporate leverage (Ginglinger and Moreau 2019). Banks and institutional investors believe that climate risk is translating into a real threat (Delis et al. 2019; Krueger et al. 2020). Therefore, climate risk is a

typical ESG risk that has potentially significant impacts on various firms, which makes it a key focus of ESG risk for firms and stakeholders. In terms of firms' endeavor on ESG to mitigate the risk they perceive, I analyze the greenhouse gas (GHG) emissions, which are under the intense spotlight from the government, public, and institutional investors (Andersson et al. 2016; Bolton and Kacperczyk 2019; Krueger et al. 2020). After the Paris Agreement, GHG emissions can now be measured more easily and more widely. The boards and shareholders can set objective requirements on GHG emissions (Homroy and Slechten 2019; Azar et al. 2021). Carbon reduction may also be contained in the performance benchmarks of asset managers' compensation (Haque 2017). Hence GHG emissions have fully attracted the attention of firms and are closely related to firms' regulatory environment, effective governance, and strategic development. Overall, I analyze the consequence of focal firms' increase in ESG-related job postings and find that they indeed reduce the climate change risk and cut their carbon emissions in the following years.

This study contributes to the literature in two aspects. First, I extend the literature on corporate investment in ESG. Prior researches measure firms' ESG engagement using ESG ratings such as KLD score (Dube and Zhu 2021), Bloomberg score (Christensen et al. 2022), and Asset 4 score (Flammer et al. 2019), which are indeed performance measures reflecting the output in ESG rather than firms' devotion to ESG. I use firms' ESG job postings as a proxy to better measure firms' true commitment to or investment in ESG (Darendeli et al. 2022). Based on the data of corporate job postings, this paper reveals the possible factor that may have an impact on corporate investment in terms of job recruitment, that is, the perceived risk from negative incidents of peer firms.

Second, I extend the literature on social learning of public knowledge. A firm can make investment, disclosure, and tax decisions based on knowledge from peers' publicly available

decisions and outcomes (Kaustia and Rantala 2015; Beatty et al. 2013; Armstrong et al. 2019; Arif et al. 2019). This paper reveals that learning is not limited to behavior imitation, but is more likely to extract necessary knowledge from existing information to help the firm itself make wiser decisions, which sheds light on the tentacles of social learning spread even wider to corporate recruitment decisions. My findings imply that requiring firms to reveal their own ESG incidents, despite being negative, could lead to beneficial spillover effects that may encourage peer firms to enhance their ESG performance by undertaking relevant investments.

2 Literature review and hypothesis development

2.1 Literature review

2.1.1 Social learning and investment decision making

Social learning theory posits that learning in the network is a more effective method for behavioral change than direct learning or successive approximations (Grusec 1994). Unlike the theory that competition should bring differentiation, strategic imitation appears to be common once a field is well established (Kennedy 1995). Bandura (1969) considered observational learning and imitation to be core components of social learning theory. Making decisions through direct analysis by themselves can be expensive and time-consuming, so a reasonable alternative is relying on others' information. One form of social learning is public learning, which refers to knowledge gained from prepared information accessible in the public domain, such as equilibrium market prices, regulatory filings, financial statements, contractual stipulations, and so on. The connections forged through public channels are cold, impersonal, and atomistic (Uzzi and Lancaster 2003), and the public information can be verified by third parties that regulate the collection and reporting of the information to the market. Since access to public knowledge does not require investment in mutual

obligations of the ties, it enables the agent to maintain many economic contacts with other participants scattered in the market (Hirschman 1970). Peer firms are influenced by similar economic conditions related to demand, supply, labor availability, and input costs. If information from peer firms informs managers of focal firms about these economic conditions, then public information can help the managers make wiser investment decisions. For example, information about peer firms' sales, cost of sales, and inventory in quarterly financial reports is valuable for firms in the same industry to predict future demand and costs (Lundholm and Sloan 2004; Curtis et al. 2014). Similarly, peer firms' estimates of future earnings, sales, and capital expenditures can assist managers of focal firms in more accurately assessing overall demand and supply conditions (Bonsall et al. 2013).

Most of the literature on learning by processing information from peer firms studies the consequences in terms of accounting decisions such as financial statement comparability (De Franco et al. 2023), accounting misconduct (Chiu et al. 2013), disclosure timing (Arif et al. 2019), frequency and content such as proprietary information (Capkun et al. 2023). Research also focuses on the real effects of public learning, such as investment decisions (Durnev and Mangen 2009; Cho and Muslu 2021; Cheng et al. 2020). However, scarce literature studies on how the learning effect influences corporate investment decisions on ESG partly due to the fact that ESG investments of individual firms are a black box that is difficult to measure objectively. Whether a firm's investment decision on ESG job posting changes with the public knowledge learned from peer firms is an interesting question to be solved in the study of social learning.

2.1.2 Peer learning in ESG

Literature has long documented learning from industry peers in aspects of accounting policy,

disclosure timing, governance, tax decisions, and so on, but only a few studies have explored the learning effects of ESG. Cao et al. (2019) investigate how firms respond to peer firms' CSR proposals that pass or fail at shareholder meetings. They find that firms adopt CSR practices after peers' CSR proposals are passed, and the result is stronger when their peers indeed implement the passed proposals. Chen et al. (2023) find a positive relationship between firms' CSR performance and their industry peers'. Robinson et al. (2023) argue that firms perceive an increased risk of litigation after their peer firm is sued for environmental disclosures. They find that in response to peers' lawsuits, firms shift away from historical environmental disclosure to a preference for providing relevant forward-looking disclosure in conference calls to meet investor demand for environmental disclosures while minimizing misrepresentation risk.

My research explores the impact of negative ESG incidents of peer firms on the ESG investment of focal firms, enriching the peer learning branch of research. In particular, learning in this study is not limited to agents learning from the same actions of their peers, or from already formed experiences of peers or their own, but extends to the agents' vigilant prevention and proactive action of potential similar risks after observation of the negative events of peers.

2.2 Hypothesis Development

2.2.1 The spillover effect of peers' negative ESG incidents on ESG investments

Information asymmetry limits rivalry and raises the likelihood that some firms possess superior information. High uncertainty means that managers have low confidence in predicting the success of different strategies and are thus more receptive to external sources of information (Lieberman 2006). Due to the fact that investments are costly and require a long preparation period, managers and investors on their own cannot fully understand all current and future risks and opportunities in

a business environment. Therefore, information from industry peers can be a valuable reference for firms' decision-making. It is essential and cost-effective for firms to pay attention to what peer firms in the same market environment are going through, extract knowledge that is useful to themselves, and react in time to keep pace with peers or take precautions against potential risks by making flexible and timely decisions.

Firms' ESG involvement is voluntary, not forced by laws and regulations, and each firm has great discretion over ESG investment. The relevant decisions made by the firm regarding ESG are often made under the circumstances of imperfect information, such as uncertainty, time limit, and cognitive limit, but can have certain economic consequences (Huang 2021). Although ESG has become a big concern for firms and investors in recent decades, it is highly uncertain whether investing in ESG pays off (Benabou and Tirole 2010; Ferrell et al. 2016; Wang et al. 2016). The costs and benefits of ESG investment are difficult to discern from the income statements. Thus, observing how peer firms handle ESG matters provides a kind of prescience, which is called social learning. If peer firms achieve great success due to investment in ESG, they are perceived as likely to have superior information on relevant business trends. Hence, there is a good chance that the focal firms follow up and increase investment in ESG, exploiting the information spillover and hoping to get a share of the cake. But the implications of social learning go beyond that. If a peer firm experiences a negative ESG incident, that is likely to trigger the tightening of regulations, the customer boycott, or more stringent requirements from investors, which together leads to a higher perception of future risks in focal firms because focal firms and their peers are in the same market facing similar producing and operating environment. In this process, negative information from peers is digested and absorbed into valuable information that is helpful to focal firms, and this spillover then promotes focal firms to make corresponding decisions to resist unknown risks,

which reflects the initiative and rationality of social learning. To fend off similar risks experienced by peers, focal firms are likely to increase their investment in ESG to fill the deficiency and strengthen the anti-risk affordability of the ESG aspect.

Setting ESG job postings is highly correlated with the overall ESG investment. For example, Darendeli et al. (2022) find that firms that increase the requirement of green skills in their job postings generate more green patents, and those green patents are of higher quality and receive more citations. Such evidence shows that firms setting ESG-related job postings are more likely to make substantial investments in ESG technology. Besides, the ESG job postings are also considered as a part of ESG budgets for human capital investment. Setting postings can mean some necessary preparations such as reviewing applications and scheduling interviews, which takes up firms' resources. Increasing ESG hiring is a fundamental ESG investment that is almost impossible to bypass because the relevant professional employees are always required to examine, plan, and improve firms' ESG performance and carry out other types of ESG investments to protect against ESG risks. Therefore, my main hypothesis is stated as follows:

H1: A firm increases ESG-related job postings after peer firms are exposed to negative ESG incidents.

However, there are situations where focal firms may not respond to peer firms' negative ESG incidents by making substantial investments due to the heterogeneity of different firms in the same industry. First, when there is a wide gap between focal firms and peer firms, even if they belong to the same industry, they may have very different operating and investment models (Hoberg and Phillips 2016), so the information in the incidents of the other party is not very useful for the focal firms' own reference. For example, if a supplier incurs a negative ESG incident during the production of raw materials, the next-level manufacturer is not exposed to the same ESG risk, so they may not make investment decisions based on such information from their peers. Second,

specific shareholders of different firms may show different preferences, and the firms tend to satisfy the demands of shareholders. If managers have the exact information that the shareholders of their firms do not have a significant preference for ESG, then the unknown ESG risk does not pose a material threat because their target investors do not care about ESG compared to more important tasks such as profit maximization. In this case, negative ESG incidents of peers may not appear as serious enough to force the focal firms to make substantial investment in the ESG aspect. Third, high-quality information is at the heart of a firm's investment and is conducive to good management. After a negative ESG incident happens to peers, vague and general media coverage may not provide enough information to encourage a firm to make a significant investment. When managers are unsure of the best investment, they ask for more information to establish accuracy. If the demand for more detailed and transparent information is not met, firms may not be willing to take the risk of investing.

2.2.2 The effect of similarity between the focal firm and peers

Information of peers that share similar attributes and context is more accessible and helps focal firms gain greater diagnostic value (Fiegenbaum and Thomas 1995; Xia et al. 2008). Due to managers' limited attention, it is more cost-effective to prioritize learning from peers that are more similar to their own, because peers who are more similar are more comparable in key characteristics such as profitability, sales, and market risk, and it is easier to acquire and digest information from those peers. In this research, two kinds of similarities are looked into: product similarity and financial statement similarity. A high product similarity between the two firms means that they are highly competitive (Hoberg and Phillips 2016), and firms constantly monitor their competitors (Brown et al. 2023). Competitors tend to make investments such as R&D and

advertising investments to increase their competitive advantage and thus reduce ex-post similarity (Hoberg and Phillips 2016). Therefore, when competitor firms incur negative ESG incidents, it is not only a risk alert, but also an opportunity for the focal firm to differentiate themselves by doing ESG well. In terms of financial statement similarity, it measures the comparability of financial statements (Brown et al. 2023). The more comparable the financial statements of peer firms and focal firms, the lower the difficulty of accurately obtaining the information needed, the higher the quantity and quality of information obtained in a certain time, and the higher the efficiency of capital allocation (De Franco et al. 2011). Overall, similarity helps focal firms acquire and analyze information that is useful to them, accelerate social learning, and make appropriate decisions. Therefore, the first part of my second hypothesis is stated as follows:

H2a: The spillover effect is more pronounced when peer firms share high similarity with focal firms.

2.2.3 The effect of stakeholders

One of the most famous discourses about why firms do ESG is the stakeholder theory. Firms' activities affect stakeholders beyond those with whom they directly interact (e.g., owners, employees, customers, and suppliers) (Freeman et al. 2007), and firms are more than a narrow production function designed to optimize the economic returns of their owners (Friedman 1970). Institutional investors are important stakeholders in the corporate governance ecosystem and are often considered influential monitors of firms. They contribute to effective corporate governance by actively engaging with firm management, exercising their voting rights, advocating for transparency and accountability, and promoting responsible investment practices. Large institutional investors are more eco-conscious and considered to be the main drivers of encouraging firms to adopt environmentally friendly practices (Azar et al. 2021; Pastor et al. 2023).

Firms that are commonly held by institutions are more likely to have closer relationships (Freeman 2019) and various forms of product market cooperation (He and Huang 2017). Common institution ownership promotes innovation dissemination as Kostovetsky and Manconi (2020) document that there are more patent citations among firms that are commonly held. Since eco-conscious institutions place more emphasis on ESG performance, negative ESG incidents in peer firms tend to cause greater alertness and risk awareness in the commonly held focal firms and then prompt focal firms to respond more efficiently to the current crisis with corresponding investment. On the other hand, I examine the role of stakeholders from the perspective of firms' internal attitudes and actions, which is called stakeholder orientation, reflecting firms' concern for individuals and larger groups (Stavrou et al. 2007) and the extent to which stakeholder interests and knowledge are incorporated into decision-making (Tantalo and Priem 2014). Stakeholder oriented firms usually give high priority to ESG and care more about the interests of stakeholders, so they pay more attention to their ESG performance. After negative ESG incidents occur in peer firms, they are more likely to make timely responses to prevent similar ESG risks and protect the interests of stakeholders. Therefore, the second part of my second hypothesis is stated as follows:

H2b: The spillover effect is more pronounced when peer firms and focal firms are commonly held by eco-conscious investors, and is more pronounced for stakeholder oriented focal firms.

2.2.4 The effect of peer firms' ESG reports

Disclosure can reduce information asymmetry and further relieve the risk-bearing capacity of market participants (Diamond and Verrecchia 1991). Soft information about intangible assets that contain a lot of value is difficult to convey accurately (Srivastava 2014). The public exposure of peer firms' negative ESG incidents is the preceding information, which can be vague and general. ESG reports provide extensive complex and unstructured information, including critical

information on important ESG incidents concerned by stakeholders, which serve as supplemental material for the public news. ESG reports are used to reduce information asymmetry (Truong et al. 2021; Krueger et al 2021), improve reputation (Moser and Martin 2012; Qiu et al. 2016), and obtain financing benefits (Dhaliwal et al. 2011). High-quality public information can help managers in focal firms assess the best level of investment (Bernard et al. 2020). For focal firms, access to transparent non-financial information can help save the hassle of conducting expensive information searches (Matsumura et al. 2014) and provide more adequate material for their learning. Peer firms' ESG reports after their negative ESG incidents help focal firms collect and analyze the information on those ESG incidents experienced by peers, which may contain the triggers of the incidents, the reactions of stakeholders to the incidents, the solutions and expectations of the peers, and other details of those negative ESG incidents. The information on the ESG reports offers supplementary information on the specific negative ESG incidents after the general news, fills the blind spots of knowledge about those incidents and prevents focal firms from searching amidst a vast amount of redundant information. It enables focal firms to find the critical information they exactly need or concern about the negative ESG incidents in a more targeted and efficient way, which further alleviates information asymmetry and reduces investment uncertainty, so that focal firms may be more motivated to make ESG investment decisions. Therefore, if the peer firms issue ESG reports, they further reduce the information acquisition cost of the focal firms, thus accelerating the spillover effect and enabling the focus firms to have a more comprehensive and clear understanding of ESG status in the industry so that reducing the uncertainty of ESG investment. Therefore, the third part of my second hypothesis is stated as follows:

H2c: The spillover effect of peer firms' exposure to negative ESG incidents on focal firms'

ESG investment is more pronounced for peer firms that issue ESG reports.

3 Research Design

3.1 Data Sources and Sample Requirements

I obtain job posting data from Raven Pack Analytics, which leverages natural language processing and machine learning to extract valuable information from job postings since August 2007, including job titles, types, descriptions, release time, firm names, and other valuable information. I identify ESG-related job postings by requiring the job type to be “Sustainable Knowledge”. My analyses also rely on data obtained from Compustat North America and Reprisk, the latter provides comprehensive coverage of negative ESG incidents and controversies that impact firms and industries worldwide. For each ESG incident, Reprisk gives the measure of “severity” (low, medium, high) and “reachness” (low, medium, high). Following Raghunandan and Rajgopal (2022), I only retain the high-profile ESG incidents to ensure that the events are visible to the focal firms and important to both themselves and the focal firms, requiring the incidents to be above medium or high severity and reachness (high-profile incidents). The final sample contains 17,840 firm-years (2,650 unique firms) spanning 2008-2020.

3.2 Empirical Model

I use the Logit model for analysis for two reasons: one is that many firms do not have ESG-related postings, especially in the early sample years, which may cause a lack of variation in the number of postings; second, the number of positions listed in each posting may vary, introducing noise into the number of postings. Therefore, I use an indicator variable to measure whether firms make ESG

investment by creating ESG-related job postings following Cen et al. (2022), which set indicator variables of job postings in supplier and customer firms as the proxy for human capital investment. My first hypothesis examines the relationship between the negative ESG incidents of peer firms and the ESG-related postings of focal firms by estimating the following Logit model:

$$\begin{aligned} \Pr(ESGPostings_{it} = 1) = & \beta_0 + \beta_1 PeerIncidents_{it} + \beta_2 lagESGPostings_{it-1} + \\ & \beta_3 Leverage_{it} + \beta_4 ROA_{it} + \beta_5 LnAssets_{it} + \beta_6 LncCapex_{it} + \beta_7 SalesGrow_{it} + \\ & \beta_8 R\&DGrow_{it} + \beta_9 BKMKT_{it} + \beta_{10} Quickr_{it} + \beta_{11} Emp_{it} + \beta_{12} Brd_{it} + \beta_{13} Totpost_{it} + \\ & \beta_{14} Npeers_{it} + \gamma Industry_i + \delta Year_t + \varepsilon_{it} \end{aligned} \quad (1)$$

where i indexes firm and t indexes year. The independent variable $PeerIncidents_{it}$ is the log value of one plus the number of focal firm i 's peer firms identified by two-digit SIC which have negative ESG incidents above medium or high severity and reachness in fiscal year t . The dependent variable $ESGPostings_{it}$ is whether the focal firm i has ESG-related job postings within 12 months following peer firms' negative ESG incidents in fiscal year t .

Equation (1) controls macroeconomic conditions through the inclusion of *Year Fixed Effects* and time-invariant industry characteristics with the inclusion of *Industry Fixed Effects* (two-digit SIC). Equation (1) also controls focal firms' ESG job posting demand in the previous year by including $lagESGPostings_{it-1}$, which is a dummy variable indicating whether the focal firm i has ESG-related job postings in fiscal year $t-1$. I base most of the control variables on Gao et al. (2023), which examines the job postings requiring accounting skills. I also include the total job postings to control focal firms' total job recruitment demand. Variable definitions are provided in Appendix A. All continuous measures are winsorized at the 1st and 99th percentiles. z-statistics

are based on standard errors that are clustered by firm. To the extent that peer firms' negative ESG incidents predict increases in a focal firm's ESG job postings, I expect a positive loading on β_1 .

3.3 Descriptive Statistics

Table 1 presents the summary statistics for the variable of interest as well as control variables. The mean value of *ESGPostings* is 0.562, which suggests the focal firm is more than half as likely to create ESG-related job postings after the negative ESG incidents of peers. On average, about six peers of each focal firm incur high-profile negative ESG incidents in a year (mean value of *ESGincidents* is 1.983), and the annual recruitment demand (*Totpost*) is large compared with the employee number (*Emp*). Other control variables are similar to prior studies (e.g., Gao et al. 2023).

4 Empirical Result

4.1 Result for H1

Table 2 provides the estimates of equation (1). Column (1) shows that *PeerIncidents* is positively related to *ESGPostings* (coeff. = 0.217, p-value < 1 percent). To gauge the economic significance of this result, I note that the marginal effect of *PeerIncidents* is 2.39%, representing a 2.39% increase in focal firms' probability of creating ESG job postings for each unit increase in *PeerIncidents*. I find that *LnAssets*, *LncCapex*, and *Brd* are positively associated with the possibility of setting ESG job postings. Among the control variables, the coefficient on *R&DGrow* is significantly positive, indicating that firms with more R&D expense are also more likely to create ESG-related job postings. Not surprisingly, I find that *ESGPostings_{it}* increases with prior ESG postings (*ESGPostings_{it-1}*), employee number (*Emp_{it}*) and total job postings (*Totpost_{it}*).

4.2 Robustness Tests

To alleviate concerns about the 12-month time period taken for the ESG job postings, I set the dependent variable $ESGPostings_{it}$ to 1 respectively if the focal firm i has ESG-related job postings within 6 months or 9 months following peer firms' negative ESG incidents in fiscal year t , otherwise to 0. In Table 3 Panel A, column (1) and column (2) present the results corresponding to 6 months and 9 months respectively. Both columns show a significant positive relationship (p-value < 1 percent) between peer firms' negative ESG incidents and focal firms' ESG-related job postings with coefficients of similar magnitude to the main result.

To further check whether firm-specific unobservable factors would change the main result, I replace the fixed effects with firm year fixed effects. The result is presented in Table 3 Panel A column (3). The positive relationship between $PeerIncidents$ and $ESGPostings$ remains significant (p-value < 5 percent).

Then I use different measures for the critical independent variable and the dependent variable. I replace the dependent variable with $N_ESGPostings$, the number of focal firms' ESG-related postings within 12 months after peers' negative ESG incidents, and replace the dependent variable with $N_PeerIncidents$, the average number of peers' high-profile negative ESG incidents in fiscal year t . Since the dependent variable is a counting variable, I use the Poisson model for analysis. Firm and year fixed effects are controlled. Table 3 Panel B presents a significantly positive coefficient of $N_PeerIncidents$ consistent with the main finding (p-value < 1 percent).

4.3 Results for H2a—Similarity

Next, I consider whether focal firms' increase in ESG-related job postings differs depending on the similarity between them and peer firms. I create $PeerInc_simi_high_{it}$ ($PeerInc_simi_low_{it}$), which is the log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and share high (low) product similarity in the industry (2-digit SIC) with focal firm i . I classify product similarity as high (low) that is greater (less) than the median product similarity of focal firm i and its peer firms' pairs in the industry. Likewise, I create $PeerInc_fss_high_{it}$ ($PeerInc_fss_low_{it}$) to differentiate the peers according to financial statement similarity (Brown et al. 2023).

In Table 4 column (1), I find that incidents of peer firms that share high product similarity with focal firms have a significantly positive relationship with ESG-related job postings in focal firms and the magnitude is comparable to the main result (coeff. = 0.274, p-value < 1 percent), whereas incidents of peer firms with lower product similarity do not have such a significant relationship. The significance test is passed at a 1% confidence level (p-value = 0.004), which confirms the difference between the coefficients of $PeerInc_simi_high_{it}$ and $PeerInc_simi_low_{it}$. In column (2), I examine the effect of financial statement similarity. The coefficient capturing higher financial statement similarity is positive and significant (p-value < 1 percent). The coefficient representing lower financial statement similarity is insignificant. The difference between $PeerInc_fss_high_{it}$ and $PeerInc_fss_low_{it}$ is significant at a 10% confidence level (p-value = 0.092).

4.4 Results for H2b—Eco-conscious Investors and Stakeholder Orientation

To test the effect of common ownership by eco-conscious investors, I create $PeerInc_eco_inst_{it}$ ($PeerInc_noeco_inst_{it}$), which is the log value of one plus the number of peer firms with high-

profile negative ESG incidents in fiscal year t and (do not) share common ownership by eco-conscious investors with focal firm i . In Table 5, I find that although both coefficients of interest are significantly positive, coefficient of $PeerInc_{eco_{inst}_{it}}$ is statistically significant at a 1% level with a greater magnitude than coefficient of $PeerInc_{noeco_{inst}_{it}}$. The significance test also reveals that the coefficient representing common ownership by eco-conscious investors are larger than that representing no such common ownership at a 5% level.

To test the effect of focal firms' stakeholder orientation, I calculate the five aspects of stakeholder orientation following Liu et al. (2019) using strengths and concerns data in the KLD stats database, i.e., customer (cus), employee ($empr$), diversity (div), community ($comm$), environment (env), and the overall measure ($stakeholder$), and interact them with the explanatory variable $PeerIncidents$. Results in Table 6 shows that focal firms with employee orientation, diversity orientation, and environment orientation are more likely to create ESG-related job postings after peers' negative ESG incidents (p-value < 1 percent). Overall, stakeholder orientation enhances the spillover effect of peers' negative ESG incidents on focal firms' ESG investments.

4.5 Results for H2c—Peers' ESG reports

I next consider whether the association between peer firms' negative ESG incidents and focal firms' ESG-related job postings is affected by peer firms' ESG reports. I create $PeerInc_{report}_{it}$ ($PeerInc_{no_{report}_{it}}$), which is the log value of one plus the number of peer firms with high-profile negative ESG incidents and (do not) issue ESG reports in fiscal year t . In Table 7 column (1), I find that the incidents of peers issuing ESG reports are positively associated with focal firms' subsequent ESG job postings, whereas the incidents of peers without ESG reports are not. The difference is statistically significant at a 1% level.

4.6 Consequence Check

The results thus far support the spillover effect that focal firms respond to peer firms' negative ESG incidents by creating more ESG-related job postings. Focal firms have the intention to increase ESG investment since the information from their industry peers conveys a potential risk in ESG aspects. An important follow-up question is whether these investment actions ultimately lead to better ESG practices and a reduced level of risk relative to ESG. I further delve into this question by estimating the following equation:

$$\begin{aligned} Conseq_{it+1,t+2} = & \beta_0 + \beta_1 ESGPostings_{it} + \beta_2 PeerIncidents_{it} + \beta_3 PeerIncidents_{it} * \\ & ESGPostings_{it} + \beta_4 Leverage_{it} + \beta_5 ROA_{it} + \beta_6 LnAssets_{it} + \beta_7 LncCapex_{it} + \\ & \beta_8 SalesGrow_{it} + \beta_9 R\&D Grow_{it} + \beta_{10} BKMKT_{it} + \beta_{11} Quickr_{it} + \beta_{12} Emp_{it} + \beta_{13} Brd_{it} + \\ & \beta_{14} Totpost_{it} + \beta_{15} Npeers_{it} + \gamma Industry_i + \delta Year_t + \varepsilon_{it} \end{aligned} \quad (2)$$

I use firms' greenhouse gas emissions as the proxy for ESG practice since cutting greenhouse gas emissions has been a growing demand for firms from the public and large institutional investors (Azar et al. 2021), putting firms' greenhouse gas emissions under the intense spotlight. Therefore, reduced greenhouse gas emissions are undoubtedly an important performance for firms' ESG practices. I use climate change risk as the proxy for ESG risk because climate risk is considered to have significant costs and practical impacts for firms (Bansal et al. 2017; Bolton and Kacperczyk 2021; Hsu et al. 2023).

Consider that it takes time for firms' job recruitments to take effect, $Conseq_{it+1,t+2}$ in equation (2) represents the mean value of greenhouse gas emissions (GHG) and climate risk ($CRisk$) respectively in fiscal year $t+1$ and $t+2$. The same covariates used in equation (1) are controlled, and Industry- and Year-fixed effects are included. The coefficient of the interaction

$PeerIncidents_{it} * ESGPostings_{it}$ (β_3) is the coefficient of interest.

Table 8 reports the results of this analysis. In column (1) and column (2), coefficients of the interaction $PeerIncidents_{it} * ESGPostings_{it}$ for tests of greenhouse gas emissions (GHG) and climate risk ($CRisk$) are both significantly negative (p-value < 1 percent), suggesting that focal firms' increased ESG job postings are associated with improvement in their ESG practices and with mitigation in the climate risk they face. Overall, this suggests that posting for ESG positions after peers' negative ESG incidents helps focal firms get better at ESG.

5 Conclusion

I examine whether firms increase ESG investment to respond to peer firms' negative incidents in ESG. Using Ravenpack database of U.S. job postings by firms from 2008 to 2020, I find that firms increase ESG investment by creating ESG-related job postings after peer firms incur high-profile negative ESG incidents, consistent with the peer learning theory. This spillover effect on ESG investment is more pronounced when there is a high similarity between peers and the focal firm, when they share common ownership by eco-conscious investors, when the focal firm is stakeholder oriented, and when the peers are more transparent in ESG.

This research also finds that firms that respond to peers' negative ESG incidents by seeking to hire employees working on ESG have a lower level of subsequent greenhouse gas emissions and mitigated climate risk compared with those that do not. This result reflects the important role of information transmission among industry peers, and suggests the rationality and effectiveness of firms' social learning.

Overall, this research contributes to the literature on social learning by shedding light on that social learning is not limited to observation and imitation, but contains transforming relevant

information into valuable knowledge that may be conducive to decision making.

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Appendix A

Variable Definitions [Source]

<i>ESGPostings</i>	1 if the focal firm has ESG-related postings within 12 months after peers' negative ESG incidents in the fiscal year t , and 0 otherwise [Ravenpack]
<i>PeerIncidents</i>	log value of one plus the number of peer firms that have high-profile negative ESG incidents (incidents that are above medium or high severity and reachness) in the fiscal year t [Reprisk]
<i>lagESGPostings</i>	1 if the focal firm has ESG-related postings in the fiscal year $t-1$, and 0 otherwise [Ravenpack]
<i>Leverage</i>	Total liabilities (lt) divided by total assets (at)
<i>ROA</i>	Income before extraordinary items (ib) divided by average total assets (at)
<i>LnAssets</i>	log value of total assets (at) plus one
<i>LncCapex</i>	Current period capital expenditures (capx) less depreciation from the statement of cash flows (dpc) scaled by total assets (at)
<i>SalesGrow</i>	Percentage change in sales (sale) between current and period year sales
<i>R&DGrow</i>	The difference between current R&D expense (xrd) and prior period expense scaled by prior year total assets (at)
<i>BKMKT</i>	Book value (at-lt) divided by market value of equity (csho*prcc_f)
<i>Quickr</i>	Current assets (act) less inventory (inv) divided by total liabilities (lt)
<i>Emp</i>	log value of one plus the total number of employees in units of thousand in the firm (emp)
<i>Brd</i>	log value of one plus the total number of board members in the firm [Boardex]
<i>Totpost</i>	log value of one plus the number of total job postings in units of thousand of the focal firm within 12 months after negative ESG incidents of peers in the fiscal year [Ravenpack]
<i>Npeer</i>	number of peer firms identified by two-digit SIC
<i>N_ESGPostings</i>	the number of ESG-related job postings of the focal firm within 12 months after peers' negative ESG incidents in the fiscal year t [Ravenpack]
<i>N_PeerIncidents</i>	average number of peers' negative ESG incidents that are above medium or high severity and reachness in the fiscal year t [Reprisk]

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Appendix A (continued)

<i>PeerInc_simi_high</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and share high product similarity with the focal firm. I define a high product similarity as the similarity is greater than the median value of the focal firm and its peer firms' pairs in the industry (2-digit SIC). [Product similarity data is obtained from Hoberg and Phillips (2016)]
<i>PeerInc_simi_low</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and share low product similarity with the focal firm. I define a low product similarity as the similarity is less than the median value of the focal firm and its peer firms' pairs in the industry (2-digit SIC). [Product similarity data is obtained from Hoberg and Phillips (2016)]
<i>PeerInc_fss_high</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and share high financial statement similarity with the focal firm. I define a high financial statement similarity as the similarity is greater than the median value of the focal firm and its peer firms' pairs in the industry (2-digit SIC). [Financial statement similarity data is obtained from Brown et al. (2023)]
<i>PeerInc_fss_low</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and share low financial statement similarity with the focal firm. I define a low financial statement similarity as the similarity is less than the median value of the focal firm and its peer firms' pairs in the industry (2-digit SIC). [Financial statement similarity data is obtained from Brown et al. (2023)]
<i>PeerInc_eco_inst</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and share common ownership by eco-conscious investors with the focal firm. I define eco-conscious investors as BlackRock, Vanguard, and State Street. [Institutional ownership data is from Thomson Reuters]
<i>PeerInc_noeco_inst</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents in fiscal year t and do not share common ownership by eco-conscious investors with the focal firm. I define eco-conscious investors as BlackRock, Vanguard, and State Street. [Institutional ownership data is from Thomson Reuters]

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Appendix A (continued)

<i>cus</i>	score of customer orientation ranging from -4 to 4, calculated following Liu et al. (2019) [data from KLD]
<i>empr</i>	score of employee orientation ranging from -4 to 4, calculated following Liu et al. (2019) [data from KLD]
<i>div</i>	score of diversity orientation ranging from -4 to 4, calculated following Liu et al. (2019) [data from KLD]
<i>comm</i>	score of community orientation ranging from -4 to 4, calculated following Liu et al. (2019) [data from KLD]
<i>env</i>	score of environment orientation ranging from -4 to 4, calculated following Liu et al. (2019) [data from KLD]
<i>stakeholder</i>	score of stakeholder orientation ranging from -4 to 4, calculated following Liu et al. (2019) [data from KLD]
<i>PeerInc_report</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents and issue ESG reports in the fiscal year t
<i>PeerInc_no_report</i>	log value of one plus the number of peer firms with high-profile negative ESG incidents and do not issue ESG reports in the fiscal year t
<i>GHG</i>	average value of total volume of greenhouse gas emissions of scope 1, scope2, and scope 3 in units of tons in fiscal years $t+1$ and $t+2$ [Trucost]
<i>Crisk</i>	average value of climate change risk in fiscal year $t+1$ and $t+2$ measured by frequency of bigrams related to climate change are mentioned together with the words “risk” or “uncertainty” in transcripts of earnings conference calls [data is obtained from Sautner et al. (2023)]

Compustat data items are in parentheses with all other data sources noted above.

Table 1**Descriptive Statistics**

Variables	N	Mean	Std. Dev	p25	p50	p75
<i>ESGPostings</i>	17943	0.5618	0.4962	0.0000	1.0000	1.0000
<i>lagESGPostings</i>	17943	0.4832	0.4997	0.0000	0.0000	1.0000
<i>PeerIncidents</i>	17943	1.9825	0.9816	1.3863	2.0794	2.7726
<i>Leverage</i>	17943	0.2701	0.2114	0.1017	0.2518	0.3918
<i>ROA</i>	17943	0.0129	0.1426	-0.0045	0.0377	0.0756
<i>LnAssets</i>	17943	7.7263	1.7947	6.5247	7.7058	8.8988
<i>LncCapex</i>	17943	-0.0014	0.0358	-0.0187	-0.0051	0.0103
<i>SalesGrow</i>	17943	0.0852	0.2909	-0.0301	0.0488	0.1436
<i>R&DGrow</i>	17943	0.0033	0.0152	0.0000	0.0000	0.0018
<i>BKMKT</i>	17943	0.5480	0.4671	0.2431	0.4275	0.7265
<i>Quickr</i>	17943	0.8545	1.0297	0.2616	0.5086	1.0002
<i>Emp</i>	17943	2.0038	1.3205	0.9219	1.8371	2.8539
<i>Brd</i>	17943	2.2914	0.2218	2.1972	2.3026	2.4849
<i>Totpost</i>	17943	1.0337	1.1377	0.1596	0.6157	1.5377
<i>Npeer</i>	17943	4.5166	1.2307	3.5553	4.6913	5.3891

This table reports descriptive statistics for the main variables over the sample period between 2008 and 2020. All continuous variables are winsorized at the 1st and 99th percentiles. Industries are defined by the two-digit SIC industry. All variables are defined in Appendix A.

Table 2	
Peers' Negative ESG Incidents and Focal Firms' ESG Postings	
Logit Model DV = <i>ESGPostings</i>	(1)
<i>PeerIncidents</i>	0.217*** (2.917)
<i>lagESGPostings</i>	1.894*** (32.68)
<i>Leverage</i>	-0.014 (-0.0916)
<i>ROA</i>	-0.254 (-1.474)
<i>LnAssets</i>	0.253*** (7.703)
<i>LncCapex</i>	1.971*** (2.735)
<i>SalesGrow</i>	-0.023 (-0.289)
<i>R&DGrow</i>	6.455*** (4.124)
<i>BKMKT</i>	-0.185*** (-3.430)
<i>Quickr</i>	-0.0299 (-1.024)
<i>Emp</i>	-0.001 (-0.0281)
<i>Brd</i>	0.392*** (2.670)
<i>Totpost</i>	0.884*** (16.72)
<i>Npeer</i>	0.288 (1.219)
<i>Constant</i>	-7.059*** (-14.23)
Industry FEs	Yes
Year FEs	Yes
Pseudo R square	0.487
Observations	17,943

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively. This table examines whether peers' negative ESG incidents affect focal firms' ESG postings. *ESGPostings* is an indicator variable taking the value of 1 if the focal firm has ESG-related postings within 12 months after peers' negative ESG incidents in fiscal year t , and 0 otherwise. *PeerIncidents* is the log value of one plus the number of peer firms that have high-profile negative ESG incidents in fiscal year t . Industry fixed effects and year fixed effects are included. Robust z-statistics clustered by firm are presented in parentheses below the coefficients. All variables are defined in Appendix A.

Table 3
Results for Robustness

Panel A			
Logit Model DV = ESGPostings	(1)	(2)	(3)
<i>PeerIncidents</i>	0.197*** (2.845)	0.260*** (3.753)	0.211** (2.400)
<i>lagESGPostings</i>	1.984*** (33.87)	1.972*** (32.87)	-0.134** (-1.978)
<i>Leverage</i>	-0.155 (-1.065)	-0.174 (-1.199)	-0.195 (-0.586)
<i>ROA</i>	-0.343** (-1.971)	-0.284* (-1.677)	0.348 (1.003)
<i>LnAssets</i>	0.274*** (8.596)	0.258*** (8.087)	0.176 (1.234)
<i>LncCapex</i>	1.510** (2.066)	1.510** (2.094)	1.072 (0.894)
<i>SalesGrow</i>	0.0556 (0.670)	0.0572 (0.691)	-0.0676 (-0.588)
<i>R&DGrow</i>	4.721*** (3.093)	5.103*** (3.363)	5.163** (2.145)
<i>BKMKT</i>	-0.144*** (-2.649)	-0.158*** (-2.917)	-0.174* (-1.859)
<i>Quickr</i>	-0.0811*** (-2.882)	-0.0717** (-2.514)	0.0357 (0.556)
<i>Emp</i>	0.00503 (0.123)	-0.00202 (-0.0484)	0.552*** (2.623)
<i>Brd</i>	0.302** (2.116)	0.234 (1.608)	0.0217 (0.070)
<i>Totpost</i>	0.820*** (16.71)	0.889*** (16.57)	1.368*** (15.22)
<i>Npeer</i>	-0.0501 (-0.220)	0.108 (0.478)	0.328* (1.956)
<i>Constant</i>	-6.478*** (-12.90)	-6.417*** (-12.14)	
Industry FEs	Yes	Yes	No
Year FEs	Yes	Yes	Yes
Firm FEs	No	No	Yes
Pseudo R square	0.4882	0.4934	0.573
Observations	17,943	17,943	14,141

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

This table presents the results of robustness tests. *ESGPostings* in columns (1), (2), (3) are indicator variables taking the value of 1 if the focal firm has ESG-related postings within 6 months, 9 months, 12 months, respectively, after peers' negative ESG incidents in fiscal year t , and 0 otherwise. *PeerIncidents* is the log value of one plus the number of peer firms that have high-profile negative ESG incidents in fiscal year t . Industry fixed effects and year fixed effects are included in column (1) and column (2). Firm fixed effects and year fixed effects are included in column (3). Robust z-statistics clustered by firm are presented in parentheses below the coefficients.

All variables are defined in Appendix A.

Table 3
Results for Robustness

Panel B	
Poisson Model DV = $N_ESGPostings$	(1)
<i>N_PeerIncidents</i>	0.775*** (6.576)
<i>Leverage</i>	-1.103* (-1.646)
<i>ROA</i>	-0.263 (-0.269)
<i>LnAssets</i>	1.066*** (3.481)
<i>LncCapex</i>	1.249 (0.314)
<i>SalesGrow</i>	-0.147 (-0.655)
<i>R&DGrow</i>	-8.884** (-2.082)
<i>BKMKT</i>	-0.195 (-0.454)
<i>Quickr</i>	-0.025 (-0.254)
<i>Emp</i>	-1.344*** (-2.949)
<i>Brd</i>	-1.131 (-1.409)
<i>Totpost</i>	0.000 (0.534)
<i>Npeer</i>	-0.688 (-0.693)
Firm FEs	Yes
Year FEs	Yes
Observations	16,482
Number of gvkey	2,128

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively. This table presents the result of robustness test using Poisson regression. $N_ESGPostings$ is the number of focal firms' ESG-related postings within 12 months after peers' negative ESG incidents in fiscal year t . $N_PeerIncidents$ is the average number of high-profile negative ESG incidents of peer firms in fiscal year t . Firm fixed effects and year fixed effects are included. Robust z-statistics clustered by firm are presented in parentheses below the coefficients. All variables are defined in Appendix A.

Table 4		
Similarity, Peers' Negative ESG Incidents, and Focal Firms' ESG Postings		
Logit Model DV = <i>ESGPostings</i>	(1)	(2)
<i>PeerInc_simi_high</i>	0.274*** (5.385)	
<i>PeerInc_simi_low</i>	0.0434 (0.617)	
<i>PeerInc_fss_high</i>		0.148*** (3.497)
<i>PeerInc_fss_low</i>		0.0370 (0.573)
<i>lagESGPostings</i>	1.896*** (31.77)	1.890*** (32.62)
<i>Leverage</i>	0.0799 (0.514)	0.0730 (0.485)
<i>ROA</i>	-0.200 (-1.117)	-0.307* (-1.765)
<i>LnAssets</i>	0.228*** (6.590)	0.246*** (7.479)
<i>LncCapex</i>	2.318*** (3.140)	1.915*** (2.639)
<i>SalesGrow</i>	-0.0344 (-0.431)	-0.0125 (-0.160)
<i>R&DGrow</i>	5.798*** (3.682)	6.617*** (4.213)
<i>BKMKT</i>	-0.206*** (-3.615)	-0.169*** (-3.099)
<i>Quickr</i>	-0.0274 (-0.904)	-0.0204 (-0.702)
<i>Emp</i>	-0.000519 (-0.0118)	0.00196 (0.0462)
<i>Brd</i>	0.420*** (2.699)	0.396*** (2.705)
<i>Totpost</i>	0.909*** (16.49)	0.879*** (16.70)
<i>Npeer</i>	0.372 (1.339)	0.357 (1.513)
<i>Constant</i>	-7.377*** (-12.92)	-7.039*** (-14.10)

(continued on next page)

Table 4 (continued)

Difference in coefficients of <i>PeerInc_simi_high</i> and <i>PeerInc_simi_low</i>	Chi-Squared Stat. = 8.34 p-value = 0.0039	
Difference in coefficients of <i>PeerInc_fss_high</i> and <i>PeerInc_fss_low</i>		Chi-Squared Stat. = 2.84 p-value = 0.0921
Industry FEs	Yes	Yes
Year FEs	Yes	Yes
Pseudo R square	0.4933	0.4871
Observations	16,996	17943

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

This table examines whether focal firms' ESG postings are differentially associated with peers' negative ESG incidents depending on the similarity between focal firms and peers. Industry fixed effects and year fixed effects are included. Robust z-statistics clustered by firm are presented in parentheses below the coefficients. A Chi-square tests is used to determine whether the difference between the coefficients of *PeerInc_simi_high* and *PeerInc_simi_low* (*PeerInc_fss_high* and *PeerInc_fss_low*) is statistically significant.

All variables are defined in Appendix A.

Table 5
Common Ownership by Eco-conscious Investors, Peers' Negative ESG Incidents,
and Focal Firms' ESG Postings

Logit Model DV = <i>ESGPostings</i>	(1)
<i>PeerInc_eco_inst</i>	0.277*** (4.719)
<i>PeerInc_noeco_inst</i>	0.137*** (2.800)
<i>lagESGPostings</i>	1.897*** (32.71)
<i>Leverage</i>	-0.00393 (-0.0266)
<i>ROA</i>	-0.246 (-1.417)
<i>LnAssets</i>	0.255*** (7.761)
<i>LncCapex</i>	1.926*** (2.679)
<i>SalesGrow</i>	-0.0250 (-0.317)
<i>R&DGrow</i>	6.521*** (4.139)
<i>BKMKT</i>	-0.181*** (-3.335)
<i>Quickr</i>	-0.0296 (-1.007)
<i>Emp</i>	-0.00151 (-0.0356)
<i>Brd</i>	0.383*** (2.614)
<i>Totpost</i>	0.882*** (16.68)
<i>Npeer</i>	0.177 (0.754)
<i>Constant</i>	-6.904*** (-14.05)
Difference in coefficients of <i>PeerInc_eco_inst</i> and <i>PeerInc_noeco_inst</i>	Chi-Squared Stat. = 4.72 p-value = 0.0298
Industry FEs	Yes
Year FEs	Yes
Pseudo R square	0.4877
Observations	17,943

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively. This table examines whether focal firms' ESG postings are differentially associated with peers' negative ESG incidents depending on the common ownership by eco-conscious institutional investors. Industry fixed effects and year fixed effects are included. Robust z-statistics clustered by firm are presented in parentheses below the coefficients. A Chi-square test is used to determine whether the difference between the coefficients of *PeerInc_eco_inst* and *PeerInc_noeco_inst* is statistically significant. All variables are defined in Appendix A.

Table 6

Stakeholder Orientation, Peers' Negative ESG Incidents, and Focal Firms' ESG Postings

DV = ESGPostings	(1)	(2)	(3)	(4)	(5)	(6)
<i>PeerIncidents</i>	0.199** (2.009)	0.184* (1.849)	0.216** (2.193)	0.181* (1.802)	0.205** (2.086)	0.183* (1.875)
<i>cus</i>	0.0857 (0.630)					
<i>PeerIncidents*cus</i>	0.0349 (0.555)					
<i>empr</i>		-0.0582 (-0.480)				
<i>PeerIncidents*empr</i>		0.158*** (2.803)				
<i>div</i>			-0.205* (-1.896)			
<i>PeerIncidents*div</i>			0.173*** (3.575)			
<i>comm</i>				0.0191 (0.0860)		
<i>PeerIncidents*comm</i>				0.204* (1.800)		
<i>env</i>					-0.0722 (-0.611)	
<i>PeerIncidents*env</i>					0.190*** (3.379)	
<i>stakeholder</i>						-0.0688 (-1.271)
<i>PeerIncidents*stakeholder</i>						0.140*** (5.694)
<i>lagESGPostings</i>	1.962*** (25.99)	1.966*** (26.00)	1.962*** (25.93)	1.966*** (25.96)	1.959*** (25.96)	1.964*** (25.92)

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Table 6 (continued)

<i>Leverage</i>	-0.127 (-0.642)	-0.111 (-0.560)	-0.123 (-0.617)	-0.0978 (-0.495)	-0.129 (-0.654)	-0.0869 (-0.437)
<i>ROA</i>	-0.410 (-1.426)	-0.461 (-1.615)	-0.414 (-1.452)	-0.435 (-1.523)	-0.509* (-1.795)	-0.432 (-1.518)
<i>LnAssets</i>	0.287*** (5.964)	0.254*** (5.305)	0.276*** (5.747)	0.262*** (5.434)	0.273*** (5.691)	0.237*** (4.917)
<i>LncCapex</i>	2.154** (2.160)	2.359** (2.378)	2.181** (2.185)	2.182** (2.194)	2.374** (2.385)	2.430** (2.453)
<i>SalesGrow</i>	0.00418 (0.0377)	0.0326 (0.294)	0.0334 (0.299)	0.0279 (0.252)	0.0240 (0.218)	0.0492 (0.435)
<i>R&DGrow</i>	5.090** (2.284)	5.017** (2.253)	4.765** (2.117)	4.979** (2.240)	5.356** (2.431)	4.607** (2.040)
<i>BKMKT</i>	-0.189** (-2.277)	-0.192** (-2.312)	-0.185** (-2.227)	-0.183** (-2.202)	-0.179** (-2.146)	-0.162** (-1.970)
<i>Quickr</i>	-0.0459 (-1.181)	-0.0550 (-1.426)	-0.0385 (-0.991)	-0.0466 (-1.209)	-0.0378 (-0.983)	-0.0520 (-1.328)
<i>Emp</i>	0.0211 (0.366)	0.0345 (0.598)	0.00888 (0.154)	0.0127 (0.221)	0.0137 (0.241)	0.0219 (0.381)
<i>Brd</i>	0.483** (2.510)	0.468** (2.454)	0.413** (2.139)	0.456** (2.388)	0.478** (2.491)	0.374* (1.947)
<i>Totpost</i>	0.905*** (14.07)	0.898*** (14.03)	0.909*** (14.01)	0.904*** (14.07)	0.898*** (13.98)	0.887*** (13.98)
<i>Npeer</i>	0.608* (1.807)	0.615* (1.819)	0.598* (1.761)	0.697** (2.020)	0.481 (1.430)	0.429 (1.291)
<i>Constant</i>	-7.866*** (-10.31)	-7.726*** (-10.36)	-7.761*** (-10.44)	-7.915*** (-10.46)	-7.635*** (-9.976)	-6.974*** (-9.156)
Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R square	0.5068	0.5082	0.5076	0.5072	0.509	0.512
Observations	11,620	11,620	11,620	11,620	11,620	11,620

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

This table examines whether focal firms' ESG postings are differentially associated with peers' negative ESG incidents depending on focal firms' stakeholder orientation using Logit regressions. Industry fixed effects and year fixed effects are included. Robust z-statistics clustered by firm are presented in parentheses below the coefficients.

All variables are defined in Appendix A.

Table 7**Peers' ESG reports, Negative ESG Incidents, and Focal Firms' ESG Postings
Logit Model DV = *ESGPostings***

	(1)
<i>PeerInc_report</i>	0.412*** (5.504)
<i>PeerInc_no_report</i>	-0.0427 (-0.830)
<i>lagESGPostings</i>	1.894*** (32.66)
<i>Leverage</i>	-0.0261 (-0.176)
<i>ROA</i>	-0.268 (-1.550)
<i>LnAssets</i>	0.255*** (7.741)
<i>LncCapex</i>	2.019*** (2.791)
<i>SalesGrow</i>	-0.0189 (-0.243)
<i>R&DGrow</i>	6.316*** (4.037)
<i>BKMKT</i>	-0.188*** (-3.471)
<i>Quickr</i>	-0.0292 (-1.000)
<i>Emp</i>	-6.61e-05 (-0.00156)
<i>Brd</i>	0.396*** (2.695)
<i>Totpost</i>	0.885*** (16.77)
<i>Npeer</i>	0.263 (1.087)
<i>Constant</i>	-6.879*** (-13.73)
Difference in coefficients of <i>PeerInc_report</i> and <i>PeerInc_no_report</i>	Chi-Squared Stat. = 24.47 p-value = 0.0000
Industry FEs	Yes
Year FEs	Yes
Psuedo R square	0.4878
Observations	17,943

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

This table examines whether focal firms' ESG postings are differentially associated with peers' negative ESG incidents depending on peers' ESG reports issuance. Industry fixed effects and year fixed effects are included. Robust z-statistics clustered by firm are presented in parentheses below the coefficients. A Chi-square test is used to determine whether the difference between the coefficients of *PeerInc_report* and *PeerInc_no_report* is statistically significant.

All variables are defined in Appendix A.

Table 8

Peers' Negative ESG Incidents, Focal Firms' ESG Postings, and Future Consequence			
OLS DV = <i>CRisk</i>	(1)	OLS DV = <i>GHG</i>	(2)
<i>ESGPostings</i>	0.236*** (3.128)	<i>ESGPostings</i>	0.149*** (4.092)
<i>PeerIncidents</i>	-0.0376 (-1.057)	<i>PeerIncidents</i>	-0.113*** (-6.898)
<i>ESGPostings*PeerIncidents</i>	-0.106*** (-2.741)	<i>ESGPostings*PeerIncidents</i>	-0.0585*** (-3.554)
<i>Leverage</i>	-0.284*** (-3.583)	<i>Leverage</i>	-0.250*** (-3.670)
<i>ROA</i>	-0.268* (-1.815)	<i>ROA</i>	-0.388*** (-5.647)
<i>LnAssets</i>	0.0127 (0.537)	<i>LnAssets</i>	0.246*** (13.36)
<i>LncCapex</i>	0.374 (0.635)	<i>LncCapex</i>	0.387 (1.219)
<i>SalesGrow</i>	-0.00434 (-0.104)	<i>SalesGrow</i>	-0.0136 (-0.600)
<i>R&DGrow</i>	-1.456** (-2.539)	<i>R&DGrow</i>	-1.254*** (-3.135)
<i>BKMKT</i>	0.0656 (1.607)	<i>BKMKT</i>	-0.0417 (-1.576)
<i>Quickr</i>	-0.0391* (-1.907)	<i>Quickr</i>	0.0323*** (3.127)
<i>Emp</i>	-0.0378 (-1.465)	<i>Emp</i>	0.197*** (8.794)
<i>Brd</i>	0.103 (1.081)	<i>Brd</i>	0.0616 (0.892)
<i>Totpost</i>	-0.0412* (-1.924)	<i>Totpost</i>	-0.00421 (-0.279)
<i>Npeer</i>	-0.0595 (-0.749)	<i>Npeer</i>	0.203*** (2.690)
<i>Constant</i>	0.587 (1.348)	<i>Constant</i>	-2.271*** (-5.991)
Industry FEs	Yes	Industry FEs	Yes
Year FEs	Yes	Year FEs	Yes
Observations	13,093	Observations	15,135
Adj R-squared	0.171	Adj R-squared	0.656

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

This table examines the effect of focal firms' ESG investment triggered by peers' negative ESG incidents on future climate risk and greenhouse gas emissions. The dependent variable in Column (1) is the average level of focal firms' climate risk in fiscal year $t+1$ and $t+2$. Industry fixed effects and year fixed effects are included. The dependent variable in Column (2) is the average level of focal firms' greenhouse gas emissions in fiscal year $t+1$ and $t+2$. Industry fixed effects and year fixed effects are included. Robust t-statistics clustered by firm are presented in parentheses below the coefficients.

All variables are defined in Appendix A.