A Matter of Reputation? Negative ESG Incidents and Corporate Risk-taking Around the World

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ABSTRACT

We investigate whether negative environmental, social, and governance (ESG) incidents affect the risk-taking behavior of firms. Using a media-based measure of negative ESG incidents and a sample of 10,267 firms from 64 countries, we show that negative ESG incidents significantly induce firms to engage in more risk-taking activities. This effect is more pronounced in countries with civil law origins, lower media freedom, lower regulatory quality, and mandatory corporate social responsibility (CSR) regulations. Further analyses reveal that negative incidents related to social issues primarily drive greater corporate risk-taking. We employ an instrumental variable approach in our empirical analyses and run several robustness tests to establish causality and strengthen our findings. Finally, we demonstrate that negative ESG incident-induced higher risk-taking is value-relevant and that it takes about 3 to 4 years for negative ESG incident-exposed firms to regain their initial lost market value via increased risk-taking.

JEL Codes: G31; G32; G34; M14

Key Words: ESG; Corporate risk-taking; Legal origin; Media freedom; Regulatory quality; CSR

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1. Introduction

Neoclassical finance primarily emphasizes on financial returns and shareholder wealth maximization (Friedman, 1970). However, in recent years, global societal demands have increased for firms to assume responsibility for environmental, social, and governance (ESG) issues, thereby encouraging firms to improve their corporate social responsibility (CSR) efforts as part of the business strategy (Kitzmueller and Shimshack, 2012). As such, corporate ESG violations, misconducts, and controversies may elevate societal awareness and erode social capital and trust, potentially damaging corporate reputations, diminishing firm value, and disrupting business operations (Davidson and Worrel, 1988; Dupont and Karpoff, 2020). Consequently, such negative ESG incident-exposed firms may face greater investor and stakeholder sanctions leading them to alter their corporate policies and strategies (Chasiotis et al., 2024; Gantchev et al., 2022; Zhou and Wang, 2020). Motivated by this literature, we examine the impact of negative ESG incidents on corporate risk-taking in this study.

Corporate risk-taking is associated with managerial choices of undertaking risky investments and projects. Extant literature suggests that corporate risk-taking is a fundamental driver of firm performance, growth, and survival (Bromiley, 1991; John et al., 2008). As noted earlier, negative ESG incident-induced loss of social and reputation capital and market value could threaten the growth and survival of firms. Further, the stakeholder sanction-driven uncertain business environments could change the investment and risk-taking strategies of negative ESG firms (Gormley and Matsa, 2011; Gormley et al., 2013). Nevertheless, how negative ESG incidents could affect corporate risk-taking remains an empirical issue as the literature offers two opposing views on the relationship.

Stakeholder and resource dependence theories indicate that negative ESG incidents could result in reduced support and increased sanctions from crucial stakeholders, potentially leading negative ESG firms to suffer from resource constraints (Freeman, 1984; Pfeffer and Salancik, 1978). Further, the erosion of social and reputational capital due to adverse ESG issues may result in increased financial risks, lower stock market liquidity, and higher cost of capital (Kölbel et al., 2017; Roy et al., 2022). All these should lead negative ESG firms to reduce risk-taking and pursue investment conservatism. On the contrary, shareholder theory suggests that the negative ESG incident-induced loss of market value should encourage corporate managers to undertake value-enhancing risky projects and investments (Friedman, 1970; Wong and Zhang, 2022). Moreover, image repair theory posits that negative ESG firms may attempt to recover their lost capital by allocating resources toward both shareholder (i.e., value-enhancing investments) and stakeholder interests (i.e., CSR) (Benoit, 1995).[1]

Attribution theory proposes that negative ESG incidents might be viewed as an indication of managerial agency problems (Kelley and Michela, 1980; Lange and Washburn, 2012). As such, corporate boards and investors may intervene and bring structural changes within the firms to improve corporate governance following adverse ESG incidents (Colak et al., 2024; Jain and Zaman, 2020). Such enhancement in corporate governance could increase corporate risk-taking (John et al., 2008; Koirala et al., 2020). Further, negative ESG incident-exposed corporate managers might be more competent in undertaking value-enhancing risk-taking activities (Bernile et al., 2017). Thus, we conjecture that negative ESG incident-induced loss of market value and the subsequent improvement in corporate governance should

[1] It was revealed in 2015 that Volkswagen had installed "defeat devices" into their diesel engines to reduce emissions during testing. Volkswagen's stock price fell by 40% in just two weeks following this scandal. Nevertheless, despite the doubts regarding the firm's ability to survive the fallout, Volkswagen became the largest auto manufacturer in the world by 2017 (Jung and Sharon, 2019).

encourage firms to pursue more risky investments and projects. We refer to this as the *risk enticement* hypothesis, which is the primary research inquiry of our study.

Studies suggest that certain country-level factors may affect the relationship between negative ESG incidents and firm risk-taking (Boubakri et al., 2013b; Wang and Li, 2019). We examine four country characteristics: legal origin, media freedom, regulatory quality, and enforcement of mandatory CSR regulations as potential moderators of the negative ESG incident-corporate risk-taking relationship. As such, we develop four *country characteristic* hypotheses. The literature suggests that civil (common) law countries tend to promote better stakeholder (investor) protections (La Porta et al., 2008; Liang and Renneboog, 2017). We conjecture that firms having stronger (weaker) CSR efforts in civil (common) law would face fewer (more) stakeholder sanctions following negative ESG incidents. Thus, civil law firms should be able to allocate more resources toward risk-taking activities compared to their common law counterparts in the aftermath of negative ESG episodes. We refer to this as the *legal origin* hypothesis.

Extant literature suggests that adverse ESG episodes are likely to receive increased media attention in high media freedom countries, leading to heightened stakeholder reactions and a decline in social and reputational capital for negative ESG firms (El Ghoul et al., 2019; Nardella et al., 2023; Wang and Li, 2019). Thus, we conjecture that, following negative ESG incidents, firms in low media freedom countries may face fewer repercussions due to informational opacity and insufficient stakeholder awareness allowing them to pursue more risk-taking activities. We refer to this as the *media freedom* hypothesis. Further, studies suggest that negative ESG firms in countries with high regulatory quality could face more litigation costs, legal challenges, and stakeholder penalties (Frooman, 1999; Wang and Li, 2019). In contrast, certain negative ESG issues may not be considered illegal due to the absence of relevant regulations in low-regulatory-quality countries (Crotty et al., 2016). Thus, we

conjecture that the lack of legal consequences following adverse ESG incidents in low-regulatory-quality countries may allow firms to engage in more risk-taking activities. We refer to this as the *regulatory quality* hypothesis.

Finally, studies suggest that mandatory CSR regulations could generate positive externalities at the cost of shareholders (Chen et al., 2018; Manchiraju and Rajgopal, 2017). In mandatory CSR regimes, adverse ESG incidents may be perceived as decoupled CSR activities that are detrimental to investors (Li and Wu, 2020). Consequently, shareholders in countries with mandatory CSR regulations are likely to respond more vigorously to adverse ESG issues and pressure firms to recuperate the lost value (Friedman, 1970). Further, mandatory CSR-induced social and reputation capital may act as insurance against negative ESG incident-induced risks and stakeholder sanctions (Albuquerque et al., 2019; Roy et al., 2022). Thus, we conjecture that firms based in countries with mandatory CSR regulations are more likely to undertake risky projects and investments following negative ESG incidents. We refer to this as the *mandatory CSR regulation* hypothesis.

We test these hypotheses using a sample of 10,267 publicly listed non-financial firms from 64 countries for the period 2007-2019. To proxy for negative ESG incidents, we use the RepRisk index (*RRI*) following the literature (Li and Cuervo-Cazurra, 2024; Zhou and Wang, 2020). As for risk-taking proxies, we consider earnings volatility (Country-adjusted standard deviation of the firm's profitability over 4-year overlapping periods) and research and development intensity (Bargeron et al., 2010; Boubakri et al., 2013a). We employ pooled OLS regressions alongside a 2SLS instrumental variable (IV) approach for mitigating endogeneity issues and establishing causality.[2] Our empirical analyses report the following findings.

[2] Section 4 provides detailed description and explanation of the empirical design and strategy utilized in this study.

First, we find that negative ESG incidents significantly induce firms to increase their risk-taking behavior. A one standard deviation increase in *RRI* is associated with an almost 2.27% (2.82%) increase in annual earnings volatility (research and development intensity) on average. These results support our primary *risk enticement* hypothesis. Second, from our tests on country characteristics, we find that corporate risk-taking significantly increases in countries with civil law origins, lower media freedom, lower regulatory quality, and mandatory CSR regulations following adverse ESG episodes. The results support all our *country characteristic* hypotheses. Our main findings are robust to a series of robustness tests that include alternative proxies of corporate risk-taking and alternative measures of negative ESG incidents.

Extending the study, we analyze which category of negative ESG incidents (i.e., environmental, social, or governance) primarily drive firms to increase risk-taking. We find that negative incidents related to social issues primarily drive corporate risk-taking. We conjecture that adverse corporate social issues are more noticeable and trigger stronger reactions in financial markets, prompting firms to engage in greater risk-taking for the recovery of market value (Roy et al., 2022). Finally, we investigate whether negative ESG incident-induced increased corporate risk-taking is value-relevant and pays off in the long run. We observe that negative ESG incidents significantly reduce firm value and that this effect persists for two years following the incidents. Nevertheless, negative ESG firms seem to regain their initial lost value in 3 to 4 years following the incidents via increased risk-taking.

Our study makes several contributions to the literature. Recent studies document that negative ESG incidents cause firms to face significant business-related issues and lose market value due to increased stakeholder and shareholder sanctions (Gantchev et al., 2022; Kölbel et al., 2017; Wong and Zhang, 2022). Consequently, firms tend to alter their corporate policies and strategies such as improving CSR efforts, increasing dividend payouts, and changing CEOs to respond to such consequences (Chasiotis et al., 2024; Colak et al., 2024; Zhou and Wang,

2020). Our study complements these studies by showing how negative ESG incidents drive firms to increase their risk-taking behavior in an effort to regain the initial lost market value. To this end, ours is the first study to investigate and show this positive association between negative ESG incidents and corporate risk-taking.

Moreover, several studies investigate how various country-level factors affect firm-level ESG performance and risk-taking behavior (Boubakri et al., 2013b; Liang and Renneboog, 2017; Wang and Li, 2019). We add to this literature by showing how different country characteristics such as legal origin, media freedom, regulatory quality, and enforcement of mandatory CSR regulations influence the interplay between negative ESG incidents and corporate risk-taking. Further, our study also contributes to the literature on the value relevance of corporate risk-taking (John et al., 2008; Koirala et al., 2020). Our study offers insights into how firms regain their lost capital through value-relevant risk-taking and investments following negative ESG incidents.

The rest of the paper is organized as follows. Section 2 provides a review of related literature and develops hypotheses. Section 3 describes the data and variables. Section 4 illustrates the empirical design and strategy. Section 5 reports all empirical findings. Finally, Section 6 concludes the paper.

2. Related literature and hypotheses development

2.1. Negative ESG incidents

Negative ESG incidents refer to corporate misbehaviors and misconducts related to ESG issues which could lead to heightened stakeholder and societal awareness (Davidson and Worrel, 1988; Dupont and Karpoff, 2020). Such incidents could be related to environmental violations (i.e., Greenhouse gas emissions, waste management, and pollution), social malpractices (i.e., Human rights abuse, child labor, and controversial products and services), and governance

controversies (i.e., Financial fraud, corruption, and inadequate or excessive executive compensation). The literature suggests that such negative incidents related to corporate ESG violations could result in severe consequences such as loss of trust and reputation capital, increased legal issues and litigation costs, and reduced stakeholder support (Elsbach and Sutton, 1992; Lange and Washburn, 2012; Nardella et al., 2023). Further, these effects are likely to be more pronounced when such incidents are reported by the media (Dyck et al., 2008; Liu and McConnell, 2013).

Recent studies document several corporate financial and non-financial outcomes of negative ESG incidents. For instance, Kölbel et al. (2017) demonstrate that firms' financial risk increases following negative ESG incidents. Further, Colak et al. (2024) show that negative ESG incidents lead to more CEO turnovers. Finally, Gantchev et al. (2022) document that negative ESG incidents create greater levels of investor and customer discontent, whereby firms experience a reduction in shareholder investments and sales following such incidents. These studies suggest that firms face greater business-related issues due to stakeholder and shareholder sanctions following negative ESG incidents. As a subsequent response, firms may change their corporate policies and strategies such as increasing dividend payouts and improving CSR efforts (Chasiotis et al., 2024; Zhou and Wang, 2020).

2.2. Negative ESG incidents and corporate risk-taking

Corporate risk-taking refers to firms' willingness to undertake strategic decisions and actions that involve a significant degree of uncertainty with the potential for higher payoffs in the long run (Bromiley, 1991; John et al., 2008). As noted earlier, negative ESG incidents induce greater business-related issues and risks for firms (Gantchev et al., 2022; Nardella et al., 2023). Under such highly uncertain business environments, firms may change their corporate investment and risk-taking strategies (Gormley and Matsa, 2011; Gormley et al., 2013). Moreover, recent

studies suggest that firms actively design executive compensation packages that incentivize managers to increase risk-taking (Coles et al., 2006; Dittmann et al., 2017). During periods of uncertain business environments, corporate boards may modify managerial compensation and option grants which could influence the risk-taking behavior of firms (Edmans and Gabaix, 2011; Gormley et al., 2013). Taken together, these studies suggest that the uncertainties and risks stemming from negative ESG incidents could influence firms' investment and risk-taking decisions. The literature offers two contrasting views on how negative ESG incidents could influence corporate risk-taking.

The external control of organization perspective views organizations as being embedded in networks of interdependencies and social relationships (Granovetter, 1985). Accordingly, stakeholder theory contends that firms need to balance the interests of all non-investing and investing stakeholders (Freeman, 1984; Harjoto and Laksmana, 2018). Further, resource dependence theory suggests that access to and control over external resources are critical for organizational success (Pfeffer and Salancik, 1978; Reitz, 1979). As such, stakeholders having control over crucial external resources could exert influence over various corporate decisions (Hillman et al., 2009). As negative ESG incidents tend to cause significant stakeholder discontent, firms may lose vital resources and support from key stakeholders following such incidents (Elsbach and Sutton, 1992; Gantchev et al., 2022; Kölbel et al., 2017). Under these circumstances, such stakeholder sanctions could depress corporate risk-taking as firms may struggle to finance potentially risky projects and investments.

Legitimacy theory assumes a certain 'social contract' between the corporation and the society and negative ESG firms, failing to comply with such 'social contract', may suffer from loss of trust, and social and reputation capital (Shocker and Sethi, 1973). The erosion of social and reputational capital in negative ESG firms may impede the execution of financial transactions by exacerbating adverse selections and moral hazard issues (Knack and Keefer,

1997; La Porta et al., 1997). In such scenarios, investors may lose confidence in negative ESG firms, potentially resulting in lower stock market liquidity and higher costs of equity (Guiso et al., 2008; Roy et al., 2022). Creditors may also penalize such negative ESG firms exposing them to increased financial risks and cost of capital (Kölbel et al., 2017). Moreover, regulators could impose increased scrutiny and discipline on negative ESG firms deterring them from engaging in risky investments (Bargeron et al., 2010). Therefore, such economic pressures and financial constraints may encourage managers of negative ESG-exposed firms to seek investment conservatism.

The literature also offers justifications for a positive association between negative ESG incidents and risk-taking. Extant literature suggests that firms engage in risky projects and investments to achieve greater competitive advantage and higher profitability, thereby ensuring long-term growth and survival (Faccio et al., 2011; John et al., 2008). Nevertheless, it is well documented in the literature that negative ESG incidents impair firm value in the immediate aftermath, which could threaten the growth and survival of negative ESG-exposed firms (Krüger, 2015; Wong and Zhang, 2022).[3] Shareholder theory suggests that the primary objective of firms is to maximize shareholder wealth (Friedman, 1970). Since investors also respond adversely to negative ESG incidents, firms should make optimal value-enhancing decisions to restore the initial lost value. Further, exposure to adverse ESG episodes could enhance the managerial ability to navigate risky situations while increasing corporate risk-taking (Bernile et al., 2017). As such, negative ESG incidents could drive firms to increase their risk-taking behavior.

[3] For instance, the BP Deepwater Horizon oil spill of 2010 caused a massive environmental catastrophe as 4.9 million barrels of oil leaked into the ocean. This incident is regarded as the largest marine oil spill in the history of the petroleum industry and one of the largest environmental disasters in world history. BP's share price plunged by 51% in just 40 days after the incident and reached its lowest level since 1996 (Fodor and Stowe, 2012).

Furthermore, attribution theory posits that negative ESG incidents might be perceived as a manifestation of managerial agency problems, as stakeholders often attribute such incidents to corporate managers (Kelley and Michela, 1980; Lange and Washburn, 2012). As such, the negative ESG incident-induced decrease in social and reputation capital and loss of firm value might be perceived as an agency issue that likely stems from self-serving managerial behavior (Colak et al., 2024; Walker et al., 2019). Further, studies suggest that such ESG misbehaviors could arise from insufficient board monitoring, executive mismanagement, and inadequate corporate governance (Murphy and Schlegelmilch, 2013; Ormiston and Wong, 2013). Thus, following negative ESG incidents, corporate boards are likely to increase monitoring and investors are likely to engage through 'voice' or 'exit' mechanisms to alleviate agency conflicts and enhance stakeholder welfare (Jain and Zaman, 2020; McCahery et al., 2016). Such pressures exerted by non-investing stakeholders, as well as corporate boards and investors in response to adverse ESG episodes, could act as an external impetus that may catalyze structural changes within the firms (Colak et al., 2024). Consequently, such enhancement in corporate governance could lead firms to pursue higher value-enhancing risky projects and investments (John et al., 2008; Koirala et al., 2020).

Moreover, image repair theory posits that organizations generally strive to rectify adverse public impressions following a negative incident or a series of negative events (Benoit, 1995). As such, firms tend to strategically engage in positive activities to restore their reputation after experiencing adverse incidents. For instance, Kang et al. (2016) show that firms engage in more CSR activities as an amendment for their past socially irresponsible behavior. Similarly, Tang and Tang (2016) propose that firms often rectify their pollution issues in response to media scrutiny to restore their public image. Thus, following negative ESG incidents, firms tend to engage in CSR activities strategically to rebuild their reputation and social contract with the stakeholders (Li and Cuervo-Cazurra, 2024; Zhou and Wang, 2020).

Such CSR activities could increase capital expenditures on properties, plants, and equipment and research and development activities to reduce pollution and waste, increase energy efficiency, and meet regulatory requirements (Liang and Renneboog, 2017). Thus, negative ESG incident-induced CSR efforts may require firms to take new corporate investments, resulting in higher risk-taking (Harjoto and Laksmana, 2018).

Finally, even though stakeholder sanctions may restrict the resources accessible to firms being exposed to adverse ESG episodes, larger firms and those possessing ample slack resources and greater reputation capital may allocate their limited resources efficiently to recover in the post-negative ESG incident periods (Rindova et al., 2005; Tang et al., 2015). Further, studies on crisis management indicate that both the public and the media possess a brief attention span, and interest in corporate misconduct generally fades away after a short period as public attention gets diverted to other events (Mena et al., 2016; Zavyalova et al., 2016). Consequently, the resource constraints imposed on firms by stakeholders are less likely to weaken the long-term oriented risk-taking behavior of firms, particularly those possessing slack resources, following negative ESG incidents.

From the above discussion, we conjecture that if negative ESG incidents impair firm value threatening long-term growth and survival, induce structural changes resulting in better corporate governance, and promote CSR activities that require long-term value-enhancing investments, then there should be a positive association between negative ESG incidents and corporate risk-taking. As such, we propose the following *risk enticement* hypothesis:

H_1: Following negative ESG incidents, corporate risk-taking increases.

2.3. Country characteristic hypotheses

The literature suggests that certain country-level characteristics could influence the association between negative ESG incidents and corporate risk-taking (Boubakri et al., 2013b; Wang and

Li, 2019). We consider four country-level characteristics, namely legal origin, media freedom, regulatory quality, and enforcement of mandatory CSR regulations, which could potentially moderate the negative ESG incident-corporate risk-taking relationship. Accordingly, we develop four *country characteristic* hypotheses in this section.

Studies suggest that the legal origin of countries is a key determinant of country-level investor and stakeholder protections (La Porta et al., 2008; Liang and Renneboog, 2017). While countries having common law origin tend to promote stronger investor protections where CSR is discretionary, civil law countries hold a more stakeholder-oriented philosophy, thereby forcing firms to engage more in CSR activities (Liang and Renneboog, 2017). Investors from civil law countries also tend to possess strong preferences for CSR, leading firms to improve their CSR efforts (Marshall et al., 2022). Thus, we expect negative ESG incidents to induce differential reactions from investors and stakeholders in countries with different legal origins.

It is well documented in the literature that CSR activities tend to improve firms' stakeholder goodwill and social and reputation capital (Minor and Morgan, 2011; Roy et al., 2022). Such CSR-induced goodwill and social capital could act as insurance and provide firms with buffers against various negative events and shocks (Albuquerque et al., 2019; Minor and Morgan, 2011). As firms domiciled in civil law countries tend to be more stakeholder-oriented, we expect such firms to receive fewer negative judgments and sanctions from stakeholders following negative ESG incidents (Liang and Renneboog, 2017). Thus, civil law firms already having better CSR efforts might be able to allocate their limited corporate resources towards value-enhancing risky projects and investments following negative ESG incidents. On the contrary, having a stronger investor-oriented philosophy and relatively weaker CSR engagements, firms in common law countries may face greater negative attributions and penalties from the stakeholders in the aftermath of negative ESG episodes (La Porta et al., 2008; Liang and Renneboog, 2017). Under such circumstances, common law firms may be

forced to withhold additional risky investments and direct their funds towards CSR activities to regain their lost social and reputation capital.

The literature suggests that CSR acts as a control mechanism to balance the interests of multiple groups of stakeholders (Harjoto and Laksmana, 2018; Mason and Simmons, 2014). As such, CSR firms should optimally equilibrate their limited resources in the interests of both investing and non-investing stakeholders (Harjoto and Laksmana, 2018). The legal origin perspective of CSR suggests that firms in civil law countries tend to put more emphasis on non-investing stakeholders and implement optimal CSR policies (Liang and Renneboog, 2017). Thus, following the negative ESG incident-induced deterioration of firm value, investors of civil law firms may demand a higher allocation of corporate resources towards value-enhancing risky projects and investments. In contrast, investor-oriented common law firms, having a higher distribution of corporate resources toward shareholder wealth maximization, may need to make higher investments in CSR to fulfill stakeholder demands following negative ESG incidents (La Porta et al., 2008). Under these circumstances, common law firms may need to restrain their risk-taking behavior. As such, we formulate the following *legal origin* hypothesis:

H_{2a}: Following negative ESG incidents, corporate risk-taking increases more in countries with civil law origins.

Studies further suggest that country-level media freedom could influence the association between negative ESG incidents and corporate risk-taking (Boubakri et al., 2013b; Wang and Li, 2019). Media freedom refers to the autonomy of the media from political interference or censorship and the degree to which society can independently communicate and express opinions (Wang and Li, 2019). In countries with greater media freedom, information asymmetry between stakeholders and firms tends to be lower as stakeholders generally possess better access to corporate information reported by the media (Bushee et al., 2010). As such,

key stakeholders such as customers, suppliers, regulators, and investors tend to be better informed and more proactive to corporate misconduct in high media freedom countries (El Ghoul et al., 2019). Consequently, following negative ESG incidents, firms in higher media freedom countries should face greater stakeholder sanctions and the withdrawal of crucial resources from stakeholders (Elsbach and Sutton, 1992; Hillman et al., 2009). This should limit firms from engaging in more risk-taking activities.

Media could also exert a direct influence on corporate decisions by raising public sentiment (Walgrave and Van Aelst, 2006). As noted earlier, the diffusion of information tends to be quicker reaching a broader audience in high media freedom countries. Thus, the negative ESG incidents should have more media focus in higher media freedom countries resulting in greater stakeholder reactions and loss of social and reputation capital for negative ESG firms (Lange and Washburn, 2012; Nardella et al., 2023). Consequently, such firms may also face higher financial and liquidity risks (Kölbel et al., 2017; Roy et al., 2022). Moreover, Dyck et al. (2008) suggest that the media can pressure corporate managers and directors to behave in ways that are socially acceptable. As such, following negative ESG episodes, firms in higher media freedom countries may increase their CSR engagements to regain their lost social and reputation capital and reduce their risk-taking activities due to having more financial and liquidity risks (El Ghoul et al., 2019). On the contrary, negative ESG firms may not face such severe consequences in countries with low media freedom due to informational opacity and lack of stakeholder awareness. Under such circumstances, firms might be able to fund more risky projects and investments. As such, we formulate the following *media freedom* hypothesis:

H_{2b}: Following negative ESG incidents, corporate risk-taking increases more in countries with lower media freedom.

Regulatory quality refers to the ability of the government to develop and implement effective policies and regulations which could be crucial for financial and private sector development (King and Levine, 1993; Mauro, 1995). Regulations are essential for governing economic activities as well as social and environmental issues (Wang and Li, 2019). As such, country-level regulatory quality could moderate the relationship between negative ESG incidents and corporate risk-taking. For instance, in countries with superior regulatory quality, firms could face more strict legislation and heightened legal and societal repercussions for adverse ESG incidents (Wang and Li, 2019). On the contrary, in countries with poor regulatory quality, certain negative ESG issues may not be deemed illegal due to either the lack of applicable laws or the existence of loopholes in current legislation (Crotty et al., 2016). Consequently, negative ESG firms domiciled in high-regulatory countries are likely to encounter more litigations and legal issues as well as greater stakeholder sanctions (Frooman, 1999; Kölbel et al., 2017). Such consequences could discourage firms in high-regulatory countries from pursuing more risk-taking activities following negative ESG incidents.

Firms domiciled in high-regulatory environments may also face stringent laws and regulations related to CSR/ESG issues. As such, following negative ESG episodes, firms in high-regulatory countries could be forced to improve their CSR efforts to satisfy the legal requirements. In contrast, in low-regulatory countries, inadequate implementation of laws and regulations may encourage firms to engage in nonmarket strategic activities, such as corruption and bribery, as more effective alternative measures to respond to adverse ESG incidents (Ioannou and Serafeim, 2012). Such nonmarket strategies could allow firms to avoid engaging in more CSR activities (Ucar and Staer, 2020). Consequently, firms in low-regulatory countries might be able to direct more resources toward risk-taking activities following negative ESG episodes. As such, we formulate the following *regulatory quality* hypothesis:

H_{2c}: Following negative ESG incidents, corporate risk-taking increases more in countries with lower regulatory quality.

Finally, we consider whether country-level mandatory CSR regulations could affect the association between negative ESG incidents and corporate risk-taking. Governments and regulatory bodies in certain countries have enacted mandatory CSR regulations which require firms to disclose and participate in socially responsible activities (Krueger et al., 2024). The literature suggests that mandatory CSR regulations could alter firm behavior and generate positive externalities at the expense of shareholders (Chen et al., 2018; Manchiraju and Rajgopal, 2017). As such, country-level CSR mandates may influence corporate risk-taking following adverse ESG incidents, as such mandatory CSR policies might limit how firms engage with their network partners.

Studies show that mandatory CSR regulations improve firm-level disclosure of and engagement in CSR activities (Chen et al., 2018; Roy et al., 2022). Negative ESG incidents in mandatory CSR regimes may be viewed as decoupled CSR actions from the mandatory CSR efforts of firms coming at the cost of investors (Li and Wu, 2020). Thus, shareholders in countries with CSR mandates are likely to be more reactive to adverse ESG issues and may exert pressure on firms to recover the negative ESG incident-induced lost value (Friedman, 1970). Further, mandatory CSR-induced social and reputation capital may act as buffers against various risks and stakeholder sanctions caused by negative ESG incidents (Albuquerque et al., 2019; Roy et al., 2022). Consequently, mandated CSR firms should be able to better allocate their resources towards value-enhancing risky projects and investments following adverse ESG episodes (Harjoto and Laksmana, 2018). As such, we formulate the following *mandatory CSR regulation* hypothesis:

H_{2d}: Following negative ESG incidents, corporate risk-taking increases more in countries with mandatory CSR regulations.

3. Data and variables

3.1. Sample and data sources

The primary research theme of this study is to explore the association between negative ESG incidents and corporate risk-taking in an international context. To capture the magnitude of negative ESG incidents, we utilize the media coverage of firms' negative ESG incidents and issues data from RepRisk.[4] Unlike conventional ESG databases, RepRisk takes an outside-in approach and employs an incident- and issue-driven method to assess firm-level negative ESG incidents by scrutinizing information from over 100,000 public sources, media channels, and stakeholders without considering firm self-disclosures. Since 2007, RepRisk has been aggregating daily updates on negative news counts related to specific corporate situations. A specific incident is recorded only once, and its impact is categorized according to the most significant source in which it is featured.

We obtain firm-level accounting and financial data from the S&P Capital IQ (CIQ) database. Block holder ownership alongside industry classification data are also sourced from the CIQ database. We merge the CIQ data with the RepRisk data using primary ISINs. The sample period of our study ranges from 2007 to 2019.[5] Our final study sample consists of 10,267 unique non-financial firms across 64 countries with a total of 108,060 firm-year observations. We further acquire country-specific macroeconomic variables (i.e., GDP per capita and annual GDP growth rate) from the World Bank's World Development Indicators

[4] RepRisk is considered to be the largest database in the world screening firm-specific ESG incidents and issues. The database has been widely used in recent empirical studies (See Gantchev et al., 2022; Kölbel et al., 2017; Li and Cuervo-Cazurra, 2024; Li and Wu, 2020; and Zhou and Wang, 2020 among others).

[5] We restrict our study period to 2019 to ensure that our results and findings do not suffer from any confounding effects of the Covid-19 global pandemic.

(WDI) database. Additionally, we obtain time-variant country-level governance indices from the World Bank's Worldwide Governance Indicators (WGI) database.

Finally, to conduct country-level heterogeneity tests, we obtain data on various country characteristics from several sources. First, we retrieve each country's legal origin classification data (i.e., common law or civil law origin) from La Porta et al. (2008). Next, we source the data on the level of media freedom (freedom index) in a country from Freedomhouse following Boubakri et al. (2013b).[6] Moreover, we acquire country-level regulatory quality index data from the WGI database following Wang and Li (2019). Finally, we procure the data on countries' mandatory CSR enactment status from Krueger et al. (2024).

3.2. Key dependent variable

The key dependent variable of interest in our study is corporate risk-taking. Following the literature, we incorporate earnings volatility as the primary measure to proxy for corporate risk-taking in our empirical investigation (Boubakri et al., 2013b; Faccio et al., 2011). As the earnings tend to be more unpredictable and volatile for risker corporate operations, earnings volatility captures the degree of risk-taking in firms' operations (John et al., 2008). Following Boubakri et al. (2013a), we measure earnings volatility (*Risk*) as the standard deviation of country-adjusted return on assets (*ROA*) over 4-year overlapping periods starting in 2007 and ending in 2019 (i.e., 2007-2010, 2008-2011, etc.). *ROA* is computed as the percentage ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets (Koirala et al., 2020).

We further employ firms' research and development intensity (*R&D*) as an alternative measure of corporate risk-taking in our empirical analysis (Bargeron et al., 2010). Investments in research and development are risky due to their low likelihood of success and the uncertain

[6] The data is publicly available at https://freedomhouse.org/report/freedom-world

and long-term nature of their payoff (Bhagat and Welch, 1995). Thus, corporate investments in research and development activities are generally considered to be more risky than alternative fund usage, reflecting firms' willingness to undertake risk (Coles et al., 2006). *R&D* is measured as the annual total monetary value of research and development expenditure as a percentage of year-end total assets (Gormley et al., 2013).

3.3. Key independent variable

We proxy for firms' negative ESG incidents and issues using the RepRisk index (*Current_RRI*), which captures the current level of firms' negative ESG exposures (Li and Cuervo-Cazurra, 2024; Zhou and Wang, 2020). As noted earlier, RepRisk monitors over 100,000 external sources and employs a machine-learning algorithm to quantify firm-level exposure to negative ESG incidents and issues. RepRisk concentrates on 28 ESG issues that align with the key international standards of ESG and business conduct.[7] The firm-level RepRisk index (*Current_RRI*) is available in monthly intervals. Since the rest of our data and variables are only available at yearly intervals, we construct an annual firm-level RepRisk index (*RRI*) by taking the maximum value of *Current_RRI* over the 12-month period in a given year.[8] *RRI* values range from 0 to 100, where 0 (100) reflects the lowest (highest) levels of annual firm-level negative ESG exposures.

3.4. Country characteristic variables

As noted earlier, we incorporate several country characteristic variables to conduct country-level heterogeneity tests on the relationship between negative ESG incidents and corporate risk-taking. The first characteristic we consider is the legal origins of countries. We follow La Porta et al. (2008) and create a civil law dummy variable (*Civil*) that takes the value of one for

[7] RepRisk methodology is available at https://www.reprisk.com/research-insights/resources/methodology

[8] For constructing the annual *RRI*, we take the 12-month maximum value instead of the annual average of the *Current_RRI* to capture the highest intensity of the negative ESG incidents and issues of a firm in a given year. Nevertheless, we also consider the 12-month average of the *Current_RRI* in alternative robustness tests.

firms domiciled in civil law countries and zero for those in common law countries. Next, we look into various levels of media freedom over the years in different countries. To proxy for media freedom, we take the freedom index (*MFI*) from Freedomhouse (Boubakri et al., 2013b). *MFI* values range between 0 and 100 where 0 (100) represents the lowest (highest) level of media freedom in country for a given year. To account for low media freedom in our analysis, we create a time varying indicator variable (*LMF*) that takes the value of one if the *MFI* value is below the sample median and zero otherwise.

We further consider the regulatory quality of various countries by taking the regulatory quality index (*RegQ*) from the WGI database (Kaufmann et al., 2011; Wang and Li, 2019). The index values are time varying and range from -2.5 to 2.5. For easier interpretation, we standardize *RegQ* on a scale from 0 to 100, with 0 (100) indicating the lowest (highest) level of regulatory quality in our sample dataset. Similar to low media freedom, we construct a time varying low regulatory quality dummy (*LRegQ*) for our analysis. *LRegQ* is set to one if the *RegQ* value is below the sample median and zero otherwise. Finally, to test the effect of country-level mandatory CSR regulations, we rely on Krueger et al. (2024), and construct a time varying indicator variable (*MCSR*). *MCSR* is set to one for the post-years after a country has enacted mandatory CSR regulation and zero otherwise.

3.5. Control variables

Following the literature, we control for several key firm and country-level variables that could potentially influence corporate risk-taking in our regressions. The literature suggests that small firms, having limited access to capital, tend to be more risk-seeking than their larger counterparts (Boubakri et al., 2013a; Whited and Wu, 2006). Thus, we control for firm size (*Size*), calculated as the natural logarithm of the year-end book value of total assets expressed in millions of US dollars (USD) (Boubakri et al., 2013b). Next, we account for firms' capital

structure (*Leverage*) as highly leveraged firms could face higher risks of financial distress, limiting their ability to invest in risky projects (Almeida and Campello, 2007). Moreover, agency conflicts between creditors and shareholders could influence corporate risk-taking choices (Acharya et al., 2011). We measure *Leverage* as the ratio of the book value of debt to equity (Roy et al., 2022). Further, we control for firms' capital expenditure intensity (*CapEx*) as capital expenditures could affect firms' operational risk (Boubakri et al., 2013a). *CapEx* is measured as the percentage ratio of total capital expenditures to total assets (Coles et al., 2006).

Studies suggest that firms' operating liquidity (cash and other liquid assets) may affect their risk-taking and investment decisions as firms tend to build up liquidity to hedge against possible future shocks and uncertainties (Almeida et al., 2004; Bates et al., 2009). Thus, we control for firms' current ratio (*CurRatio*), defined as the ratio of current assets to current liabilities (Koirala et al., 2020). We further control for firm profitability (*ROA*), calculated as EBITDA as a percentage of total assets, as higher profitability may indicate lower operational risk (Boubakri et al., 2013a). Further, firms with greater growth potential may have more investment opportunities and engage in higher risk-taking (Guay, 1999). Thus, we control for firms' market-to-book ratio (*MB*), computed as the year-end total market capitalization scaled by the total book value of equity, as a proxy for growth potential (Gormley et al., 2013). Finally, large shareholders could directly influence corporate investments and risk-taking (Faccio et al., 2011). Thus, we control for block holder ownership (*BlockOwn*), taken as the percentage share ownership of the largest shareholder of the firm (John et al., 2008).

Following the literature, we also include a number of measures to control for country-level characteristics that could influence corporate risk-taking (Boubakri et al., 2013a, 2013b; John et al., 2008). These include countries' GDP growth rate (*GDP_Gr*), GDP per capita (*GDP_PC*), taken as the natural logarithm of GDP per capita, and country governance index

(*CGI*).[9] We provide a summary of all key variable details and their sources in Table A1 of the Appendix. To reduce the impact of outliers, we winsorize all continuous variables at the conventional 1st and 99th percentiles in our sample dataset.

3.6. Descriptive statistics

Table 1 provides the descriptive statistics of all the key variables used in our analysis. Panel A reports the summary statistics of our key risk-taking variables for the full sample. We observe that *Risk* (earnings volatility) has a sample mean (standard deviation) of 3.53% (4%) with values ranging between 0.28% and 20.56%. The annual average *R&D* is 0.71% with a standard deviation of 2.46%. Panel B provides the sample summary statistics of our key independent and country characteristics variables. The mean RepRisk index (*RRI*) is seen to be 11.59 with a standard deviation of 14.92 for all firm-years. Further, it is seen that *RRI* values range between 0 to 89 with the 75th percentile value being 25. Looking at country characteristics, we find that about 48% of the observations belong to civil law origin (Civil Mean = 0.48, Std. Deviation = 0.50). The media freedom index (*MFI*) has a mean of 75.98 and a median value of 88. *MFI* values range from 7 to 100 in our sample. The mean regulatory quality index (*RegQ*) is 60.18 having normalized values ranging from 0 to 100. *MCSR* shows a mean of 0.38 indicating that 38% of the firm-year observations fall under mandatory CSR regimes.

[Table 1 about here]

In Panel C, we report the summary statistics of all firm- and country-level control variables. The sample exhibits annual averages of leverage (*Leverage*) at 0.89, capital expenditure (*CapEx*) at 4.84%, and current ratio (*CurRatio*) at 2.14. Profitability (*ROA*) has a

[9] For measuring *CGI*, we follow Kaufmann et al. (2011) who track yearly governance indicators across six dimensions for over 200 countries starting from 1996. The six dimensions are namely "Voice and Accountability", "Political Stability and Absence of Violence/Terrorism", "Government Effectiveness", "Regulatory Quality", "Rule of Law", and "Control of Corruption". For each country, we take the yearly average of the estimates across these six dimensions and then normalize the values between 0 to 100 to generate *CGI*.

mean of 7.64% with a standard deviation of 13.62%. The average annual market to book ratio (*MB*) is 2.30, while the mean block holder ownership (*BlockOwn*) is 24.91%. Lastly, the mean GDP growth rate (*GDP_Gr*) is 3.12%, while the mean country governance index (*CGI*) is 63.36, with normalized values spanning from 0 to 100.

Finally, Panel D provides a summary statistics of the key dependent, independent, and country characteristic variables by each country in our sample. Among the major economies, we find Australia, Canada, Russia, United States (US), Hong Kong, and United Kingdom (UK) to have the highest annual average earnings volatilities (*Risk*). In contrast, Japan seems to have lowest level of *Risk*, followed by Italy, France, Switzerland, and Germany. These findings are consistent with those of Boubakri et al. (2013b). Further, we find the US to have the highest research and development intensity (R&D) followed by Sweden, Germany, Switzerland, France, and Japan among the major economies. Looking at the RepRisk index (*RRI*), we find Germany to have the highest annual average *RRI* in the sample followed by Switzerland, France, Russia, the UK, and the US among the major economies. In contrast, Hong Kong, China, and Singapore seem to have comparatively lower levels of annual average *RRI*. Considering media freedom, we observe that countries in the west generally have higher annual average *MFI* with Finland and Norway scoring a perfect score of 100. It is also observed that media freedom is generally higher in the European countries. Among the major economies, China and Russia seem to have the lowest levels of media freedom. In terms of regulatory quality, Hong Kong and Singapore seem to top the chart whereas Russia, India, and China seem to have the lowest annual average *RegQ* among the major economies. Finally, the *MCSR* variable indicates that some of the countries including Australia, Canada, and France had already implemented mandatory CSR regulations prior to or at the beginning of our sample period.

4. Empirical design and strategy

To examine the relationship between negative ESG incidents and corporate risk-taking, we conduct pooled OLS regressions incorporating both firm and year fixed effects as outlined in specification (1). The regression specification takes the following general form:

$$CRT_{ict} = \alpha + \beta.RRI_{ict-1} + \boldsymbol{X_{it-1}}.\boldsymbol{\delta'} + \boldsymbol{Z_{ct-1}}.\boldsymbol{\theta'} + \gamma_i + \tau_t + \varepsilon_{ict} \quad (1)$$

where the dependent variable CRT_{ict} is the corporate risk-taking, proxied by earnings volatility (*Risk*) or research and development intensity (*R&D*), all as defined in Section 3.2, of firm *i* in country *c* in year *t*. The key independent variable RRI_{ict-1} is the RepRisk index, as defined in Section 3.3, of firm *i* in country *c* in year *t-1*. $\boldsymbol{X_{it-1}}$ and $\boldsymbol{Z_{ct-1}}$ are vectors of one year lagged key firm-level and country-level control variables, respectively, that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *MB*, *BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Section 3.5. γ_i and τ_t control for firm and year fixed effects, respectively. Finally, ε_{ict} denotes the error term. Standard errors are clustered at the firm level in all regressions. It is to be noted here that we lag the key independent (*RRI*) and all control variables by one year in all our regressions to mitigate the issues of reverse causality. The key coefficient of interest from specification (1) is β, which reflects the impact of negative ESG incidents on corporate risk-taking.

Even though we lag our key independent variable by a year in our baseline pooled OLS regressions, we recognize that our estimates from specification (1) may be subjected to endogeneity concerns, especially related to omitted variables. To address endogeneity concerns, we employ an instrumental variable (IV) approach. To do so, we construct a geography-based and an industry-based IV. Specifically, we take the annual average negative ESG news reach of all peer firms (excluding the focal firm) in the firm's country (*NReach_Coun*) and the annual average negative ESG news count of all peer firms (excluding

the focal firm) in the firm's industry (*NCount_Ind*) as exogenous instruments following the literature (Harjoto and Laksmana, 2018; Wang and Li, 2019).[10] We expect both the country-level peer firms' average negative ESG news reach and industry-level peer firms' average negative ESG news count to be positively correlated with the focal firms' RepRisk index (*RRI*). However, peer firms' average negative ESG news reach or count should not affect the focal firm's risk-taking or investment decisions, which satisfies the exclusion restriction. As such, to address endogeneity and to establish a causal relationship between negative ESG incidents and corporate risk-taking, we run the following 2SLS IV regressions as per specification (2):

$$\begin{aligned} RRI_{ict-1} = {} & \alpha + \lambda.NReach\_Coun_{ict-1} + \omega.NCount\_Ind_{ijt-1} + \boldsymbol{X_{it-1}}.\boldsymbol{\delta'} \\ & + \boldsymbol{Z_{ct-1}}.\boldsymbol{\theta'} + \gamma_i + \tau_t + \varepsilon_{ict} \\ CRT_{ict} = {} & \alpha + \beta.\widehat{RRI_{ict-1}} + \boldsymbol{X_{it-1}}.\boldsymbol{\delta'} + \boldsymbol{Z_{ct-1}}.\boldsymbol{\theta'} + \gamma_i + \tau_t + \varepsilon_{ict} \end{aligned} \quad (2)$$

In the first stage, we regress the one year lagged firm-level RepRisk index (*RRI*) on the one year lagged instruments, $NReach\_Coun_{ict-1}$ and $NCount\_Ind_{ijt-1}$, and all other firm- and country-level control variables lagged by one year alongside firm and year fixed effects. $NReach\_Coun_{ict-1}$ ($NCount\_Ind_{ijt-1}$) is the average negative ESG news reach (count) of all peer firms in the focal firm *i*'s country *c* (industry *j*) in year *t-1*. In the second stage, we regress our dependent variable CRT_{ict}, proxied by *Risk* or *R&D* and as outlined in specification (1), on the one-year lagged fitted values of the RepRisk index ($\widehat{RRI_{ict-1}}$) derived from the first stage, along with all other one year lagged firm- and country-level control variables, in addition to firm and year fixed effects. The key coefficient of interest is β, which indicates the causal association between negative ESG incidents and corporate risk-taking.

[10] We obtain firm-level negative ESG news reach and count data from RepRisk.

Finally, to test how various country characteristics affect the relationship between negative ESG incidents and corporate risk-taking, we run regressions as per the following general specification (3):

$$CRT_{ict} = \alpha + \beta.(RRI_{ict-1} \times Count\_Char_{ct}) + \lambda.RRI_{ict-1} + \omega.Count\_Char_{ct} + \boldsymbol{X_{it-1}}.\boldsymbol{\delta'} + \boldsymbol{Z_{ct-1}}.\boldsymbol{\theta'} + \gamma_i + \tau_t + \varepsilon_{ict} \quad (3)$$

where the variables CRT_{ict} and RRI_{ict-1} are as per specification (1). $Count\_Char_{ct}$ is the country characteristic indicator variable that, depending on the Model, is either *Civil*, *LMF*, *LRegQ*, or *MCSR*, all as defined in Section 3.4. $\boldsymbol{X_{it-1}}$ and $\boldsymbol{Z_{ct-1}}$ represent vectors of one-year lagged firm- and country-level control variables, respectively, as per specification (1). γ_i and τ_t account for firm and year fixed effects, respectively. The key coefficient of interest is from the interaction term ($RRI_{ict-1} \times Count\_Char_{ct}$) or β, which demonstrates the moderating effect of a specific country-level characteristic on the relationship between negative ESG incidents and corporate risk-taking.

5. Empirical results

5.1. The effect of negative ESG incidents on corporate risk-taking

We initiate our empirical analysis by performing tests associated with our primary hypothesis *H_1*. We run pooled OLS regressions with firm and year fixed effects according to specification (1) and conduct the IV analysis as outlined in specification (2). The first stage estimates of the 2SLS IV regression are displayed in Model [1] of Table 2. As per our prediction, we find that the coefficients on both the IVs (*NReach_Coun* and *NCount_Ind*) are positive and highly significant (at the 1% level), indicating that both the IVs are substantially positively correlated with *RRI*. To check the validity of our instruments, we perform supplementary diagnostic tests including under-identification and weak identification tests following Kleibergen and Paap

(2006). Further, we conduct the Hansen J test for over-identifying restrictions (Hansen, 1982). The Kleibergen-Paap rank LM statistic is 651.35 (Chi-square p-value = 0.000), suggesting that our IVs do not suffer from under-identification issues and exhibit a strong correlation with *RRI*. The Kleibergen-Paap rank Wald F statistic of 367.57 surpasses the Stock and Yogo (2005) threshold for a maximal IV size of 10% (Critical value = 19.93), demonstrating that the IVs effectively capture exogenous variations in *RRI*. Finally, the Hansen J test statistic is insignificant (p-value = 0.82), indicating that we cannot reject the null hypothesis that the instruments are valid.

[Table 2 about here]

We present the OLS regression results for *Risk* and *R&D* in Models [2] and [4], respectively, of Table 2. In both the Models, we find the coefficients of *RRI* to be positive (0.005 for *Risk* and 0.001 for *R&D*) and highly significant (at the 1% level). The findings demonstrate a substantial positive relationship between *RRI* and corporate risk-taking. We estimate that, on average, a one standard deviation increase in *RRI* leads to an increase in earnings volatility (*Risk*) and *R&D* by approximately 0.08% and 0.02%, respectively.[11] These figures are economically significant as the 0.08% (0.02%) increase in *Risk* (*R&D*) translates to almost a 2.27% (2.82%) increase in earnings volatility (research and development intensity) when compared to the respective sample means. The regression coefficients on most of the control variables carry the expected signs.

Models [3] and [5] of Table 2 present the estimates derived from the second stage of the 2SLS IV specification for *Risk* and *R&D*, respectively. Consistent with our findings from the OLS regressions, the second stage IV estimates also reveal a highly significant (at the 1%

[11] The standardized regression coefficients of *RRI* for *Risk* and *R&D* are 0.019 and 0.006, respectively. *Risk* (*R&D*) has a sample standard deviation of 4% (2.46%). One standard deviation increase in *RRI* would lead to (0.019×4%) = 0.08% increase in *Risk* and (0.006×2.46%) = 0.02% increase in *R&D* on average across all firms.

level) negative relationship between *RRI* and corporate risk-taking across both the proxies (*Risk* and *R&D*). Furthermore, the IV analysis alleviates concerns regarding endogeneity in our OLS estimates and confirms a causal association between negative ESG incidents and corporate risk-taking. Overall, the findings from our OLS and IV analyses corroborate our primary *risk enticement* hypothesis H_1, indicating that firms promote their risk-taking behavior after being exposed to negative ESG incidents.

5.2. Robustness tests of risk enticement hypothesis

We conduct two robustness tests to validate our main findings in Section 5.1 further and provide additional support to our primary hypothesis *risk enticement* H_1. These consist of tests with alternate corporate risk-taking proxies and alternative measures of firm-level negative ESG incidents and issues. The tests and their findings are briefly discussed below.

5.2.1. Alternative risk-taking proxies

Following the literature, we develop two alternative proxies for corporate risk-taking which include cash flow volatility and earnings volatility based on operating margin (Boubakri et al., 2013a; Gopalan et al., 2021). We measure cash flow volatility (*Risk2*) as the standard deviation of cash flow to asset ratio over 4-year overlapping periods. Further, following Boubakri et al. (2013a), we measure alternative earnings volatility (*Risk3*) as the standard deviation of operating margin over 4-year overlapping periods where operating margin is calculated as EBITDA as a percentage of net sales. We employ these alternate risk-taking proxies as the dependent variables in the OLS specification (1) and the IV specification (2) and derive the estimates. The results are presented in Table A2 of the Appendix. Models [1] ([2]) and [3] ([4]) show the estimates from the OLS (second stage of the 2SLS IV) specification for *Risk2* and *Risk3*, respectively. We observe that the regression coefficient on *RRI* consistently remains positive and highly significant (at least at the 5% level) for both alternative risk-taking

measures in all the Models. These results further indicate that negative ESG incidents trigger greater levels of risk-taking at the firm level, which is in line with our main findings in Section 5.1, thereby reinforcing our primary *risk enticement* hypothesis H_1.

5.2.2. Alternative measures of negative ESG incidents

We consider three alternative measures of negative ESG incidents and issues for additional tests. First, we take the peak RepRisk index (*Peak_RRI*), which captures the highest intensity of negative ESG incidents and issues of a firm every 2 years. Next, we also consider the 12-month average of the RepRisk index (*Avg_RRI*) of firms as an alternative measure to *RRI*. Finally, we take the year-on-year change in the RepRisk index (*RRI_Trend*) as a measure of firms' trends regarding negative ESG issues and incidents. We employ each of these alternative measures (lagged by one year) in place of *RRI* in the OLS specification (1) and run the regressions with our primary risk-taking proxies (*Risk* and *R&D*) as the dependent variables. We tabulate the results in Table A3 of the Appendix. We find the coefficients of all three alternative measures of negative ESG incidents across all the Models to be positive and highly significant (at least at the 5% level). Thus, the results from these additional tests further validate the positive relationship between negative ESG incidents and corporate risk-taking and provide additional support to our primary *risk enticement* hypothesis H_1.

5.3. The role of country characteristics

To test how different country characteristics influence the association between negative ESG incidents and corporate risk-taking, we run regressions as per the general specification (3). The results are presented in Table 3. Models [1] to [4] report the regression estimates for earnings volatility (*Risk*) whereas Models [5] to [8] show the results for research and development intensity (*R&D*). First, we consider the country's legal origin (*Civil*) in Models [1] and [5]. In both Models, we observe that the coefficients of the interaction term (*RRI* × *Civil*) are positive

and highly significant (at the 1% level). The results imply that, compared to the firms from common law countries, firms domiciled in civil law countries undertake more risky projects including research and development activities after experiencing negative ESG incidents. This supports our legal origin hypothesis H_{2a} that corporate risk-taking increases more in civil law countries than in common law countries following negative ESG incidents.

[Table 3 about here]

In Models [2] and [6], we test how country-level media freedom (*LMF*) affects the relationship between negative ESG incidents and firm risk-taking. We find the coefficient on the interaction term (*RRI* × *LMF*) to be positive and highly significant (at the 1% level) across both Models. This indicates that low media freedom acts as a catalyst in the positive relationship between negative ESG incidents and corporate risk-taking such that negative ESG incidents induce greater corporate risk-taking in lower media freedom countries. Overall, the results support our media freedom hypothesis H_{2b}. Next, we assess the moderating effect of country-level regulatory quality (*LRegQ*) in Models [3] and [7]. It is seen that the coefficient on the interaction term (*RRI* × *LRegQ*) remains positive and highly significant (at the 1% level) in both Models. From the results, we can infer that firms residing in countries with low regulatory quality tend to pursue higher risk-taking in the aftermath of negative ESG episodes. This supports our regulatory quality hypothesis H_{2c}. Finally, Models [4] and [8] show how country-level mandatory CSR regulations (*MCSR*) affect the negative ESG incident-corporate risk-taking relationship. The coefficient on the interaction term (*RRI* × *MCSR*) remains positive and highly significant (at the 1% level) throughout both Models. The results support our mandatory CSR regulation hypothesis H_{2d} that negative ESG incidents result in higher corporate risk-taking in countries with CSR mandates.[12]

[12] To further validate the findings in Section 5.3, we conduct additional robustness tests using alternative corporate risk-taking proxies and alternative measures of negative ESG incidents as in Section 5.2. The results from these

5.4. Which category of negative ESG incidents matters more for risk-taking?

Thus far, we have established that negative ESG incidents lead firms to increase their risk-taking activities. In this section, we emphasize on how the environment (E), social (S), and governance (G) related negative incidents individually affect and drive corporate risk-taking. For this, we segregate the RepRisk index (*RRI*) into the environment (*Env_RRI*), social (*Soc_RRI*), and governance (*Gov_RRI*) categories. We employ these variables in place of *RRI* in the OLS specification (1) and derive the estimates. We present the results in Table 4. Models [1] to [4] and [5] to [8] show the regression estimates for earnings volatility (*Risk*) and research and development intensity (*R&D*), respectively. We observe that the coefficients of *Soc_RRI* are positive and highly significant (at least at the 5% level) across all the Models. However, *Env_RRI* seems to be only significantly related to *R&D* whereas *Gov_RRI* seems to primarily affect earnings volatility (*Risk*). From these results, we can determine that negative incidents related to corporate social issues tend to drive risk-taking more than those related to environmental and governance issues. We conjecture that negative corporate social incidents tend to be more visible and generate greater reactions in the financial markets leading firms to undertake riskier investments for recovery (Roy et al., 2022). Nevertheless, it is also important to recognize that negative environmental incidents tend to promote firms' research and development activities, which could be related to environmental protection (i.e., environmental R&D activities) (Liang and Renneboog, 2017).

[Table 4 about here]

additional robustness tests remain consistent and in line with our main findings in Section 5.3, providing further support to all our *country characteristic* hypotheses.

5.5. Does negative ESG incident-induced risk-taking pay off?

Recent studies provide evidence that firms tend to lose market value in the immediate aftermath of being exposed to negative ESG incidents (Krüger, 2015; Wong and Zhang, 2022). Nevertheless, the literature on corporate risk-taking suggests that firms undertake more risky investments and projects to obtain higher growth, ensure survival, and maximize shareholder value (Bromiley, 1991; John et al., 2008). Thus, in this section, we investigate whether the negative ESG incident-induced corporate risk-taking generates payoffs and helps firms to recover their lost value in the long run. To test this proposition, we conduct regression analysis as per the following specification (4):

$$TobinQ_{it+n} = \alpha + \beta.(RRI_{it} \times DRisk_{it}) + \lambda.RRI_{it} + \omega.DRisk_{it} + \boldsymbol{X_{it}}.\boldsymbol{\delta'} + \boldsymbol{Z_{ct}}.\boldsymbol{\theta'} + \gamma_i + \tau_t + \varepsilon_{it} \quad (4)$$

where the dependent variable $TobinQ_{it+n}$ is the proxy for firm value (Tobin's Q) of firm *i* in the lead year *t+n* (where *n* ranges from 1 to 4). RRI_{it} is the RepRisk index, as defined in Section 3.3, of firm *i* in year *t*. $DRisk_{it}$ is a time varying dummy variable that takes the value of one if firm *i*'s earnings volatility (*Risk*) increases from year *t-1* to *t* and zero otherwise. $\boldsymbol{X_{it}}$ and $\boldsymbol{Z_{ct}}$ are vectors of key firm- and country-level control variables, respectively, that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Section 3.5. γ_i and τ_t control for firm and year fixed effects, respectively. The key coefficient of interest is from the interaction term $(RRI_{it} \times DRisk_{it})$ or β, which shows the effect of negative ESG incident-induced increased risk-taking on long-term firm value.

[Table 5 about here]

Table 5 reports the regression results obtained from specification (4). From Models [1] and [2], we observe that the regression coefficients of *RRI* are negative and highly significant

(at least at the 5% level), implying that negative ESG incidents significantly reduce firm value in the subsequent year *t+1*. This negative effect seems to persist till the second year following the incidents as indicated by the results in Models [3] and [4]. The coefficient on the interaction term (*RRI* × *DRisk*) remains insignificant in Models [2] and [4], indicating that negative ESG firms are unable to recuperate the lost market value via increased risk-taking in the first two years following the incidents. However, in Model [6], we see a positive but insignificant association between *RRI* and the firm value in the year *t+3* following negative ESG incidents. It becomes apparent in Model [7] that this positive effect is primarily driven by the negative ESG incident-induced increased risk-taking (coefficient of the interaction term (*RRI* × *DRisk*) is positive and significant at the 10% level). This trend seems to continue in year four following the incidents as Model [8] shows a highly significant (at the 1% level) association between negative ESG incident-induced increased risk-taking and firm value in the year *t+4*. Overall, from this analysis, we can conclude that it takes about three to four years on average for negative ESG incident-exposed firms to regain their initial lost market value through increased corporate risk-taking.

6. Conclusion

Negative ESG incidents could heighten public awareness and cause significant stakeholder sanctions, potentially damaging social and reputation capital, reducing market value, and threatening the growth and survival of firms (Gantchev et al., 2022; Kölbel et al., 2017; Wong and Zhang, 2022). As such, firms tend to modify their corporate policies and strategies to mitigate these issues and better adjust to the circumstances (Chasiotis et al., 2024; Zhou and Wang, 2020). Inspired by this literature, we investigate the influence of adverse ESG incidents on corporate risk-taking in this study. In line with the conjectures that negative ESG incidents instigate structural reforms that enhance corporate governance and encourage CSR efforts that

require long-term investments, our empirical analyses convincingly demonstrate that firms significantly increase their risk-taking behavior following adverse ESG episodes.

Further analyses reveal that negative ESG incidents primarily induce greater risk-taking in firms domiciled in countries with civil law origins, lower media freedom, lower regulatory quality, and mandatory CSR regulations. In addition, we show that negative incidents related to social issues primarily drive higher corporate risk-taking. Finally, our results showcase that negative ESG incident-induced elevated. Even though adverse ESG incidents reduce firm value in the subsequent periods, we find that negative ESG firms tend to regain their initial lost value in 3 to 4 years following the incidents via increased risk-taking. Our study has important implications for corporate managers as we emphasize the importance of undertaking necessary reforms to mitigate agency conflicts among all stakeholders and encourage corporate investments, innovation, and growth following negative ESG incidents.

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Table 1: Descriptive statistics

Table 1 provides the summary statistics of all key variables. Panels A, B, and C report the sample summary statistics of the key dependent, independent, and control variables, respectively. Panel D provides descriptive statistics of the key dependent and independent variables by country. *Risk* is the country-adjusted standard deviation of the firm's profitability (*ROA*) over 4-year overlapping periods, where *ROA* is measured as the percentage ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. *R&D* is the total research and development expenditures expressed as a percentage of total assets. *RRI* is the maximum value of the firm-level RepRisk index (*Current_RRI*) over the 12-month period in a given year. *Civil* is an indicator variable that takes the value of one for firms domiciled in Civil law countries and zero otherwise. *MFI* and *RegQ* are the country-level freedom index and regulatory quality index, respectively. *MCSR* is an indicator variable that takes the value one for the post-years after a country has enacted mandatory CSR regulation and zero otherwise. *Size* is the natural logarithm of total assets. *Leverage* is the ratio of the book value of debt-to-equity. *CapEx* is the percentage ratio of total capital expenditures to total assets. *CurRatio* is the ratio of current assets to current liabilities. *MB* is the market capitalization scaled by book value of equity. *BlockOwn* is the percentage share ownership of the largest shareholder. *GDP_Gr* is the year-on-year GDP growth rate. *GDP_PC* is the natural logarithm of GDP per capita. Finally, *CGI* is the yearly mean of the six governance indicators of Kaufmann et al. (2011) normalized between 0 to 100. See Table A1 of the Appendix for a detailed description and sources of the variables. The sample period of the study ranges from 2007 to 2019. Data sources: S&P Capital IQ (CIQ), RepRisk, Freedomhouse, La Porta et al. (2008), Krueger et al. (2024), World Bank's World Development Indicators (WDI), and Worldwide Governance Indicators (WGI) databases.

Variable	Observations	Mean	Std. Deviation	Min	P25	Median	P75	Max
Panel A: Corporate risk-taking variables								
Risk	89,050	3.53	4.00	0.28	1.15	2.17	4.17	20.56
R&D	107,791	0.71	2.46	0.00	0.00	0.00	0.00	16.24
Panel B: RepRisk index and country characteristic variables								
RRI	108,060	11.59	14.92	0.00	0.00	0.00	25.00	89.00
Civil	107,823	0.48	0.50	0.00	0.00	0.00	1.00	1.00
MFI	107,342	75.98	27.39	7.00	67.00	88.00	95.00	100
RegQ	107,918	60.18	24.64	0.00	31.99	69.88	80.83	100
MCSR	108,060	0.38	0.48	0.00	0.00	0.00	1.00	1.00
Panel C: Control variables								
Size	108,060	7.24	2.27	1.10	5.82	7.29	8.71	12.75
Leverage	107,881	0.89	1.72	-4.03	0.11	0.48	1.09	10.74
CapEx	107,791	4.84	5.81	0.00	0.90	3.03	6.44	31.83
CurRatio	107,678	2.14	2.92	0.05	0.91	1.38	2.19	21.07
ROA	98,313	7.64	13.62	-68.18	3.84	8.62	13.75	38.49
MB	107,881	2.30	3.17	-5.19	0.79	1.45	2.72	20.49
BlockOwn	108,060	24.91	22.83	0.00	6.88	16.14	39.46	91.48
GDP_Gr	107,819	3.12	3.16	-14.76	1.55	2.53	5.02	25.16
GDP_PC	107,819	9.96	1.18	6.53	9.02	10.63	10.81	11.64
CGI	107,722	63.36	26.68	0.00	32.75	78.35	82.95	100

Panel D: Descriptive statistics by country

Country	Observations	*Risk*	*R&D*	*RRI*	*Civil*	*MFI*	*RegQ*	*MCSR*
Argentina	409	4.52	0.19	9.81	1	80.75	11.04	0.92
Australia	3,598	6.29	0.39	10.31	0	96.89	86.92	1.00
Austria	414	2.06	0.36	11.85	1	96.11	76.90	0.30
Bangladesh	331	2.80	0.00	6.73	0	51.17	5.86	0.00
Belgium	490	2.19	1.25	13.55	1	96.71	70.87	0.86

Bermuda	427	3.53	0.49	9.19	0	-	66.37	0.00
Brazil	2,216	3.71	0.01	12.27	1	78.47	31.16	0.00
Canada	5,968	6.01	0.31	10.51	0	98.61	83.87	1.00
Cayman Islands	54	3.97	0.28	13.07	0	-	62.04	0.00
Chile	804	2.94	0.00	9.76	1	95.73	74.87	0.40
China	12,637	3.04	0.45	8.92	1	15.89	25.33	0.94
Colombia	318	3.07	0.00	9.69	1	62.22	42.78	0.00
Cyprus	186	5.56	0.00	7.10	0	93.76	66.28	0.31
Denmark	636	3.04	1.88	11.55	1	97.46	84.88	0.32
Egypt	239	4.32	0.00	7.31	1	27.96	14.93	0.00
Finland	640	2.17	0.93	13.84	1	100	86.12	0.34
France	2,023	2.18	1.06	16.29	1	93.48	68.11	1.00
Germany	1,771	2.76	1.31	17.48	1	95.52	81.53	0.32
Greece	415	3.66	0.00	7.02	1	85.56	48.73	1.00
Guernsey	110	7.00	0.00	7.64	-	-	-	0.00
Hong Kong	3,353	3.61	0.22	8.48	0	64.99	92.39	0.39
India	6,165	3.41	0.08	10.16	0	76.48	21.85	0.39
Indonesia	1,216	3.55	0.00	10.95	1	64.69	25.42	0.67
Ireland	519	3.61	1.57	15.39	0	96.78	82.94	0.30
Israel	1,249	3.01	1.24	8.59	0	81.35	68.78	0.00
Italy	1,176	2.11	0.13	13.30	1	89.55	56.45	0.30
Japan	7,745	1.87	0.85	10.62	1	91.09	68.09	0.00
Jersey	127	7.33	0.00	11.70	-	-	61.95	0.00
Jordan	154	5.22	0.00	8.82	1	36.63	37.11	0.00
Kazakhstan	113	3.82	0.00	8.46	1	25.34	27.65	0.00
Kenya	297	3.75	0.00	10.00	0	53.72	24.90	0.00
Kuwait	167	2.57	0.00	8.76	1	41.06	33.04	0.00
Luxembourg	264	2.76	0.53	14.84	1	99.02	83.71	0.00
Malaysia	1,605	2.84	0.00	10.45	0	47.46	50.43	1.00
Mauritius	109	5.75	0.00	4.86	1	89.68	60.24	0.00
Mexico	735	2.78	0.00	11.54	1	66.72	41.39	0.00
Mongolia	1	4.99	0.94	13.00	1	85.00	31.88	0.00
Morocco	168	3.01	0.00	7.49	1	42.06	27.30	0.00
Netherlands	888	3.35	1.38	14.68	1	98.93	87.17	0.31
New Zealand	403	3.44	0.32	9.52	0	97.13	89.41	0.00
Nigeria	503	3.57	0.00	11.58	0	47.79	8.37	0.00
Norway	797	3.89	0.01	11.45	1	100	80.56	0.56
Pakistan	915	4.44	0.00	7.51	0	40.30	13.31	0.85
Peru	477	4.68	0.01	9.12	1	71.99	45.76	0.37
Philippines	1,247	3.35	0.02	10.31	1	62.28	29.89	0.70
Poland	596	3.59	0.01	7.98	1	91.19	60.65	0.33
Portugal	289	2.29	0.00	12.56	1	97.01	58.71	0.75
Romania	160	3.83	0.00	6.33	1	82.68	48.98	0.33
Russia	1,166	4.41	0.02	15.51	1	24.56	19.91	0.00
Saudi Arabia	213	2.46	0.02	8.61	0	10.39	33.62	0.00
Singapore	1,117	3.51	0.01	9.45	0	50.22	92.20	0.28
South Africa	1,194	3.72	0.00	13.51	0	81.69	41.98	0.78
South Korea	6,402	3.40	0.69	12.15	1	84.91	62.00	0.00
Spain	907	3.00	0.27	17.13	1	95.76	62.86	0.62
Sri Lanka	209	3.29	0.00	5.54	0	49.94	26.99	0.00

Sweden	1,213	3.18	1.33	12.83	1	99.84	85.76	0.33
Switzerland	1,376	2.36	1.25	16.41	1	96.37	83.21	0.00
Thailand	982	3.37	0.07	10.86	0	40.04	37.99	0.00
Turkey	554	2.70	0.25	8.25	1	54.92	39.84	0.47
Ukraine	155	7.06	0.00	7.75	1	63.35	16.51	0.00
UAE	262	3.29	0.00	11.31	0	22.48	55.37	0.00
United Kingdom	4,284	3.44	0.48	13.91	0	96.04	84.35	0.56
United States	22,677	3.75	1.71	13.53	0	91.71	74.89	0.00
Vietnam	225	3.97	0.00	6.57	1	20.12	16.39	0.00
Total	108,060	3.53	0.71	11.59	0.48	75.98	60.18	0.38

Table 2: Negative ESG incidents and corporate risk-taking

Table 2 reports the regression results from the pooled OLS specification (1) and the 2SLS IV specification (2). Model [1] shows the first stage estimates of the 2SLS IV specification (2), where the one-year lagged RepRisk index (*RRI*), as defined in Table 1, is instrumented by one-year lagged *NReach_Coun* and *NCount_Ind*. *NReach_Coun* (*NCount_Ind*) is the average negative ESG news reach (count) of all peer firms in the focal firm's country (industry). Models [2] ([4]) and [3] ([5]) show the pooled OLS and second stage of the 2SLS IV estimates, respectively where the dependent variable is *Risk* (*R&D*), as defined in Table 1. One year lagged firm-level and country-level control variables that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *MB BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Table 1, are included in all regressions alongside firm and year fixed effects. Standard errors are clustered at the firm level and t-stats are presented in parenthesis. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period of the study ranges from 2007 to 2019. Data sources: CIQ, RepRisk, WDI, and WGI databases.

Dependent variable:	*RRI*	*Risk*		*R&D*	
	First Stage	OLS	IV	OLS	IV
	[1]	[2]	[3]	[4]	[5]
RRI		**0.005*** **	**0.033*** **	**0.001*** **	**0.024*** **
		(4.79)	**(3.19)**	**(2.90)**	**(7.68)**
Size	1.767***	-0.744***	-0.797***	-0.064***	-0.106***
	(14.00)	(-12.50)	(-12.64)	(-3.67)	(-5.84)
Leverage	0.002	-0.001	-0.001	0.004	0.004
	(0.04)	(-0.07)	(-0.05)	(1.07)	(1.10)
CapEx	0.003	-0.005	-0.005	0.001	0.001
	(0.31)	(-1.14)	(-1.18)	(0.71)	(0.52)
CurRatio	-0.032	-0.034***	-0.034***	-0.003	-0.003
	(-1.33)	(-2.81)	(-2.77)	(-0.93)	(-0.82)
ROA	-0.035***	-0.031***	-0.030***	-0.002**	-0.002
	(-5.48)	(-8.76)	(-8.49)	(-2.07)	(-1.35)
MB	-0.019	0.018*	0.018*	-0.005	-0.005
	(-0.80)	(1.83)	(1.86)	(-1.47)	(-1.37)
BlockOwn	-0.011**	-0.004**	-0.004**	-0.001	-0.000
	(-2.24)	(-2.35)	(-2.09)	(-1.63)	(-0.57)
GDP_Gr	-0.020	-0.022***	-0.022***	-0.018***	-0.017***
	(-0.70)	(-2.69)	(-2.59)	(-8.45)	(-7.67)
GDP_PC	-2.137***	0.815***	0.881***	0.852***	0.906***
	(-3.01)	(3.54)	(3.76)	(12.44)	(12.36)
CGI	-0.015	0.007	0.007	0.011***	0.011***
	(-0.60)	(1.05)	(1.03)	(5.38)	(5.09)
NReach_Coun	11.410***				
	(23.82)				
NCount_Ind	5.372***				
	(11.72)				
Adj. R^2	0.46	0.58	-	0.90	-
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap rk LM	651.35***	-	-	-	-
Kleibergen–Paap rk Wald F	367.57	-	-	-	-
Hansen J stat (p-value)	0.82	-	-	-	-
Observations	88,140	88,140	88,140	88,042	88,042

Table 3: The role of country characteristics

Table 3 reports the regression results from the general specification (3). Depending on the Model, the dependent variable is either earnings volatility (*Risk*) or research and development intensity (*R&D*), all as defined in Table 1. *RRI* is the RepRisk index, as defined in Table 1, lagged by one year. *Civil* and *MCSR* are indicator variables as described in Table 1. *LMF* (*LRegQ*) is an indicator variable that takes the value of one if the value of the freedom index (regulatory quality index) is below the sample median and zero otherwise. One year lagged firm-level and country-level control variables that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *MB BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Table 1, are included in all regressions alongside firm and year fixed effects. Standard errors are clustered at the firm level and t-stats are presented in parenthesis. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period of the study ranges from 2007 to 2019. Data sources: CIQ, RepRisk, Freedomhouse, La Porta et al. (2008), Krueger et al. (2024), WDI, and WGI databases.

Dep. Var:	*Risk*				*R&D*			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
RRI × Civil	**0.006*** **				**0.003*** **			
	(3.18)				**(4.04)**			
RRI × LMF		**0.006*** **				**0.002*** **		
		(3.56)				**(2.70)**		
LMF		-0.065				**-0.089** **		
		(-0.83)				**(-2.36)**		
RRI × LRegQ			**0.005*** **				**0.002*** **	
			(2.85)				**(3.43)**	
LRegQ			0.030				**0.153*** **	
			(0.53)				**(5.27)**	
RRI × MCSR				**0.004*** **				**0.003*** **
				(2.60)				**(4.29)**
MCSR				**-0.117***				**-0.120*** **
				(-1.91)				**(-5.88)**
RRI	**0.003*** **	**0.003*** **	**0.004*** **	**0.004*** **	-0.000	0.000	-0.000	-0.000
	(2.66)	**(2.83)**	**(3.01)**	**(3.87)**	(-0.80)	(0.54)	(-0.37)	(-0.44)
Size	-0.541***	-0.545***	-0.543***	-0.548***	-0.062***	-0.063***	-0.063***	-0.066***
	(-12.11)	(-12.17)	(-12.14)	(-12.20)	(-3.58)	(-3.63)	(-3.68)	(-3.81)
Leverage	0.008	0.008	0.008	0.008	0.004	0.004	0.004	0.004
	(0.69)	(0.69)	(0.69)	(0.71)	(1.03)	(1.06)	(1.01)	(1.05)
CapEx	-0.004	-0.004	-0.004	-0.004	0.001	0.001	0.001	0.001
	(-1.27)	(-1.26)	(-1.23)	(-1.25)	(0.71)	(0.73)	(0.95)	(0.70)
CurRatio	-0.027***	-0.027***	-0.027***	-0.027***	-0.003	-0.003	-0.003	-0.003
	(-3.04)	(-3.02)	(-3.01)	(-2.99)	(-0.96)	(-0.94)	(-0.85)	(-0.89)
ROA	-0.020***	-0.020***	-0.020***	-0.020***	-0.002**	-0.002**	-0.002**	-0.002**
	(-8.14)	(-8.13)	(-8.13)	(-8.15)	(-2.06)	(-2.05)	(-2.03)	(-2.09)
MB	0.010	0.010	0.010	0.010	-0.005	-0.005	-0.005	-0.005
	(1.41)	(1.39)	(1.40)	(1.42)	(-1.44)	(-1.47)	(-1.45)	(-1.43)
BlockOwn	-0.003*	-0.003*	-0.003*	-0.003*	-0.001*	-0.001*	-0.001*	-0.001
	(-1.91)	(-1.93)	(-1.94)	(-1.84)	(-1.65)	(-1.69)	(-1.72)	(-1.43)
GDP_Gr	-0.019***	-0.019***	-0.019***	-0.019***	-0.017***	-0.017***	-0.017***	-0.016***
	(-2.75)	(-2.74)	(-2.82)	(-2.72)	(-8.22)	(-8.27)	(-8.37)	(-7.19)
GDP_PC	0.553***	0.491**	0.503**	0.566***	0.840***	0.825***	0.779***	0.859***
	(2.85)	(2.51)	(2.57)	(2.91)	(12.35)	(12.11)	(11.77)	(12.62)
CGI	0.004	0.005	0.006	0.004	0.011***	0.011***	0.015***	0.011***
	(0.69)	(0.85)	(0.98)	(0.67)	(5.39)	(5.36)	(7.41)	(5.23)
Adj. R^2	0.57	0.57	0.57	0.57	0.90	0.90	0.90	0.90
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	88,140	88,140	88,140	88,140	88,042	88,042	88,042	88,042

Table 4: ESG incident category

Table 4 reports the regression results from the general pooled OLS specification (1). Depending on the Model, the dependent variable is either earnings volatility (*Risk*) or research and development intensity (*R&D*), all as defined in Table 1. *Env_RRI*, *Soc_RRI*, and *Gov_RRI* are the RepRisk index values segregated into environmental, social, and governance issues, respectively, all lagged by one year. One year lagged firm-level and country-level control variables that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *MB BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Table 1, are included in all regressions alongside firm and year fixed effects. Standard errors are clustered at the firm level and t-stats are presented in parenthesis. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period of the study ranges from 2007 to 2019. Data sources: CIQ, RepRisk, WDI, and WGI databases.

Dep. Var:	*Risk*				*R&D*			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Env_RRI	-0.000			-0.000	**0.002*** **			**0.001*** **
	(-0.06)			(-0.02)	**(2.97)**			**(2.72)**
Soc_RRI		**0.003** **		**0.004** **		**0.001*** **		**0.001*** **
		(2.12)		**(2.56)**		**(2.74)**		**(2.64)**
Gov_RRI			**0.008*** **	**0.009*** **			0.001	**0.001***
			(5.16)	**(5.31)**			(1.55)	**(1.84)**
Size	-0.710***	-0.713***	-0.714***	-0.717***	-0.052***	-0.052***	-0.052***	-0.054***
	(-12.19)	(-12.24)	(-12.27)	(-12.31)	(-3.24)	(-3.26)	(-3.21)	(-3.33)
Leverage	-0.000	-0.000	-0.001	-0.001	0.003	0.003	0.003	0.003
	(-0.01)	(-0.00)	(-0.04)	(-0.04)	(0.94)	(0.93)	(0.91)	(0.93)
CapEx	-0.005	-0.005	-0.005	-0.005	0.001	0.001	0.001	0.001
	(-1.18)	(-1.19)	(-1.17)	(-1.18)	(0.83)	(0.81)	(0.83)	(0.82)
CurRatio	-0.033***	-0.033***	-0.033***	-0.033***	-0.003	-0.003	-0.003	-0.003
	(-2.78)	(-2.78)	(-2.79)	(-2.79)	(-0.99)	(-0.99)	(-1.00)	(-0.99)
ROA	-0.030***	-0.030***	-0.030***	-0.030***	-0.002*	-0.002*	-0.002*	-0.002*
	(-8.65)	(-8.65)	(-8.59)	(-8.58)	(-1.68)	(-1.67)	(-1.66)	(-1.65)
MB	0.017*	0.017*	0.017*	0.017*	-0.004	-0.004	-0.004	-0.004
	(1.78)	(1.78)	(1.79)	(1.79)	(-1.42)	(-1.43)	(-1.43)	(-1.42)
BlockOwn	-0.004**	-0.004**	-0.004**	-0.004**	-0.001**	-0.001**	-0.001**	-0.001**
	(-2.34)	(-2.32)	(-2.31)	(-2.29)	(-2.01)	(-1.98)	(-2.00)	(-1.96)
GDP_Gr	-0.022***	-0.022***	-0.022***	-0.022***	-0.017***	-0.017***	-0.017***	-0.017***
	(-2.73)	(-2.74)	(-2.71)	(-2.72)	(-9.12)	(-9.16)	(-9.12)	(-9.12)
GDP_PC	0.751***	0.763***	0.747***	0.761***	0.822***	0.827***	0.822***	0.827***
	(3.31)	(3.36)	(3.30)	(3.36)	(12.75)	(12.80)	(12.74)	(12.79)
CGI	0.007	0.007	0.007	0.007	0.011***	0.011***	0.011***	0.011***
	(1.07)	(1.06)	(1.06)	(1.05)	(5.41)	(5.40)	(5.42)	(5.39)
Adj. R^2	0.58	0.58	0.58	0.58	0.91	0.91	0.91	0.91
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	88,140	88,140	88,140	88,140	88,042	88,042	88,042	88,042

Table 5: Negative ESG incident-induced risk-taking and firm value

Table 5 reports the regression results from specification (4). Depending on the Model, the dependent variable is either one, two, three, or four year lead Tobin's Q (*TobinQ*). *RRI* is the RepRisk index, as defined in Table 1. *DRisk* is an indicator variable that takes the value of one if the firm's year-on-year change in earnings volatility (*Risk*) is positive and zero otherwise. Firm-level and country-level control variables that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Table 1, are included in all regressions alongside firm and year fixed effects. Standard errors are clustered at the firm level and t-stats are presented in parenthesis. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period of the study ranges from 2007 to 2019. Data sources: CIQ, RepRisk, WDI, and WGI databases.

Dep. Var:	$TobinQ_{t+1}$		$TobinQ_{t+2}$		$TobinQ_{t+3}$		$TobinQ_{t+4}$	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
RRI* × *DRisk		-0.000		0.000		**0.001***		**0.001*****
		(-0.70)		(0.16)		**(1.73)**		**(4.18)**
DRisk		**0.022*****		0.007		-0.002		0.011
		(2.79)		(1.00)		(-0.27)		(1.52)
RRI	**-0.001*****	**-0.001****	**-0.001***	**-0.001***	0.001	0.000	**0.001***	-0.000
	(-3.33)	**(-2.52)**	**(-1.84)**	**(-1.66)**	(1.63)	(0.47)	**(1.73)**	(-0.82)
Size	-0.426***	-0.425***	-0.368***	-0.368***	-0.284***	-0.284***	-0.190***	-0.190***
	(-23.65)	(-23.61)	(-23.63)	(-23.62)	(-20.01)	(-20.00)	(-14.56)	(-14.51)
Leverage	-0.005	-0.005	0.002	0.002	0.003	0.003	0.005*	0.005*
	(-1.59)	(-1.61)	(0.69)	(0.68)	(1.03)	(1.02)	(1.74)	(1.69)
CapEx	0.004***	0.004***	-0.001	-0.001	-0.003***	-0.003***	-0.003***	-0.003***
	(2.67)	(2.66)	(-1.16)	(-1.16)	(-3.07)	(-3.07)	(-3.21)	(-3.20)
CurRatio	0.004	0.004	-0.004	-0.004	-0.003	-0.003	-0.004	-0.004
	(1.30)	(1.29)	(-1.43)	(-1.43)	(-1.19)	(-1.18)	(-1.43)	(-1.43)
ROA	0.005***	0.005***	0.003***	0.003***	0.001	0.001	-0.001	-0.001
	(4.48)	(4.50)	(2.98)	(2.99)	(1.15)	(1.15)	(-0.88)	(-0.85)
BlockOwn	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001
	(0.10)	(0.11)	(1.16)	(1.16)	(1.00)	(0.99)	(1.16)	(1.11)
GDP_Gr	0.017***	0.017***	0.019***	0.019***	0.010***	0.010***	0.003	0.003
	(7.82)	(7.82)	(9.40)	(9.40)	(5.52)	(5.53)	(1.54)	(1.58)
GDP_PC	0.087	0.086	-0.219***	-0.219***	-0.141**	-0.143**	-0.074	-0.078
	(1.15)	(1.14)	(-3.01)	(-3.01)	(-2.10)	(-2.13)	(-1.15)	(-1.22)
CGI	0.003	0.003*	-0.004**	-0.004**	-0.015***	-0.015***	-0.019***	-0.019***
	(1.64)	(1.66)	(-2.30)	(-2.28)	(-8.52)	(-8.52)	(-10.11)	(-10.07)
Adj. R^2	0.68	0.68	0.71	0.71	0.73	0.73	0.75	0.75
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	88,043	88,043	78,898	78,898	69,969	69,969	61,344	61,344

APPENDIX

Table A1: Variable description and sources

Variable	Description	Source
Risk-taking variables		
Risk	The country-adjusted standard deviation of the firm's profitability (*ROA*) over 4-year overlapping periods starting in 2007 and ending in 2019, where *ROA* is measured as the percentage ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets	CIQ
R&D	Total research and development expenditures expressed as a percentage of total assets	CIQ
Key independent variable		
RRI	The maximum value of the firm-level RepRisk index (*Current_RRI*) over the 12-month period in a given year	RepRisk
Country characteristic variables		
Civil	Indicator variable that takes the value of one for firms domiciled in civil law countries and zero otherwise	La Porta et al. (2008)
MFI	Country-level freedom index	Freedomhouse
RegQ	Country-level regulatory quality index	WGI
MCSR	Indicator variable that takes the value one for the post-years after a country has enacted mandatory CSR regulation and zero otherwise	Krueger et al. (2024)
Key firm-level control variables		
Size	Natural logarithm of total assets	CIQ
Leverage	The ratio of the book value of debt-to-equity	CIQ
CapEx	Total capital expenditures expressed as a percentage of total assets	CIQ
CurRatio	Ratio of current assets to current liabilities	CIQ
ROA	EBITDA expressed as a percentage of total assets	CIQ
MB	Market capitalization scaled by book value of equity	CIQ
BlockOwn	Annual additions to property, plant, and equipment scaled by total assets	CIQ
Key country-level control variables		
GDP_Gr	Country's annual GDP growth rate	WDI
GDP_PC	Natural logarithm of country's GDP per capita	WDI
CGI	Annual mean of country's six governance indicators of Kaufmann et al. (2011) normalized between 0 to 100	WGI
Instrumental variables		
NReach_Coun	the average negative ESG news reach of all peer firms in the focal firm's country	RepRisk
NCount_Ind	the average negative ESG news count of all peer firms in the focal firm's industry	RepRisk

Table A2: Alternative risk-taking proxies

Table A2 reports the regression results from the pooled OLS specification (1) and the second stage of the 2SLS IV specification (2), as indicated in each Model. Depending on the Model, the dependent variable is either cash flow volatility (*Risk2*), measured as the standard deviation of cash flow to asset ratio over 4-year overlapping periods, or alternative earnings volatility (*Risk3*), measured as the standard deviation of operating margin over 4-year overlapping periods where operating margin is calculated as EBITDA as a percentage of net sales. *RRI* is the RepRisk index, as defined in Table 1, lagged by one year. In the IV Models, one year lagged *RRI* is instrumented by one year lagged *NReach_Coun* and *NCount_Ind*, all as shown in Table 2. One year lagged firm-level and country-level control variables that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *MB BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Table 1, are included in all regressions alongside firm and year fixed effects. Standard errors are clustered at the firm level and t-stats are presented in parenthesis. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period of the study ranges from 2007 to 2019. Data sources: CIQ, RepRisk, WDI, and WGI databases.

Dependent variable:	*Risk2*		*Risk3*	
	OLS	IV	OLS	IV
	[1]	[2]	[3]	[4]
RRI	**0.007*** **	**0.040** **	**0.025*** **	**0.163** **
	(4.25)	**(2.14)**	**(3.54)**	**(2.07)**
Size	-1.748***	-1.813***	-3.910***	-4.164***
	(-14.58)	(-14.39)	(-6.54)	(-6.55)
Leverage	-0.086***	-0.085***	-0.354***	-0.353***
	(-3.22)	(-3.17)	(-2.61)	(-2.61)
CapEx	-0.004	-0.004	0.035	0.035
	(-0.48)	(-0.51)	(0.82)	(0.83)
CurRatio	-0.066**	-0.065**	0.648***	0.658***
	(-2.48)	(-2.43)	(4.30)	(4.35)
ROA	-0.060***	-0.058***	-0.522***	-0.517***
	(-9.56)	(-9.36)	(-15.86)	(-15.82)
MB	0.077***	0.077***	0.157*	0.158*
	(4.61)	(4.63)	(1.94)	(1.95)
BlockOwn	-0.010***	-0.009***	-0.031**	-0.028**
	(-3.25)	(-3.07)	(-2.20)	(-2.04)
GDP_Gr	-0.039***	-0.039***	-0.123**	-0.119*
	(-2.63)	(-2.61)	(-1.98)	(-1.92)
GDP_PC	1.321***	1.422***	9.481***	9.876***
	(3.26)	(3.39)	(5.28)	(5.32)
CGI	0.005	0.004	0.008	0.007
	(0.40)	(0.35)	(0.15)	(0.12)
Adj. R^2	0.66	-	0.76	-
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	74,144	74,144	84,726	84,726

Table A3: Alternative measures of negative ESG incidents

Table A3 reports the regression results from the general pooled OLS specification (1). Depending on the Model, the dependent variable is either earnings volatility (*Risk*) or research and development intensity (*R&D*), all as defined in Table 1. *Peak_RRI* is the peak RepRisk index of firms every 2 years. *Avg_RRI* is the the 12-month average of the RepRisk index. *RRI_Trend* is the year-on-year change in the RepRisk index. All key independent variables are lagged by one year in all Models. One year lagged firm-level and country-level control variables that include *Size*, *Leverage*, *CapEx*, *CurRatio*, *ROA*, *MB BlockOwn*, *GDP_Gr*, *GDP_PC*, and *CGI*, all as defined in Table 1, are included in all regressions alongside firm and year fixed effects. Standard errors are clustered at the firm level and t-stats are presented in parenthesis. *, **, and *** denote statistical significance at the 10%, 5% and 1% significance levels, respectively. The sample period of the study ranges from 2007 to 2019. Data sources: CIQ, RepRisk, WDI, and WGI databases.

Dep. Var:	*Risk*			*R&D*		
	[1]	[2]	[3]	[4]	[5]	[6]
Peak_RRI	**0.003*** **			**0.001*** **		
	(3.15)			**(3.78)**		
Avg_RRI		**0.007*** **			**0.002*** **	
		(3.78)			**(2.78)**	
RRI_Trend			**0.004*** **			**0.001** **
			(4.13)			**(2.11)**
Size	-0.742***	-0.742***	-0.738***	-0.064***	-0.064***	-0.062***
	(-12.45)	(-12.46)	(-12.40)	(-3.71)	(-3.68)	(-3.59)
Leverage	-0.001	-0.001	-0.001	0.004	0.004	0.004
	(-0.08)	(-0.08)	(-0.05)	(1.06)	(1.06)	(1.08)
CapEx	-0.005	-0.005	-0.005	0.001	0.001	0.001
	(-1.13)	(-1.15)	(-1.14)	(0.72)	(0.70)	(0.72)
CurRatio	-0.034***	-0.034***	-0.034***	-0.003	-0.003	-0.003
	(-2.81)	(-2.82)	(-2.81)	(-0.93)	(-0.94)	(-0.93)
ROA	-0.031***	-0.031***	-0.032***	-0.002**	-0.002**	-0.002**
	(-8.77)	(-8.77)	(-8.80)	(-2.05)	(-2.07)	(-2.09)
MB	0.018*	0.018*	0.018*	-0.005	-0.005	-0.005
	(1.84)	(1.84)	(1.82)	(-1.46)	(-1.47)	(-1.48)
BlockOwn	-0.004**	-0.004**	-0.004**	-0.001	-0.001	-0.001*
	(-2.37)	(-2.34)	(-2.39)	(-1.63)	(-1.61)	(-1.67)
GDP_Gr	-0.022***	-0.022***	-0.022***	-0.018***	-0.018***	-0.018***
	(-2.69)	(-2.71)	(-2.69)	(-8.44)	(-8.48)	(-8.46)
GDP_PC	0.806***	0.822***	0.800***	0.851***	0.854***	0.849***
	(3.51)	(3.57)	(3.48)	(12.42)	(12.46)	(12.41)
CGI	0.007	0.007	0.007	0.011***	0.011***	0.011***
	(1.06)	(1.07)	(1.02)	(5.39)	(5.40)	(5.38)
Adj. R^2	0.58	0.58	0.58	0.90	0.90	0.90
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	88,140	88,140	88,140	88,042	88,042	88,042