Greenhushing and Reputational Threat: Theory and Evidence

Abstract:

Motivated by the importance of credible sustainability disclosure and concerns about reputational risk, this study investigates greenhushing—the deliberate under-communication of strong corporate sustainability performance. As stakeholders increasingly demand transparent and reliable ESG disclosures, firms face a strategic dilemma: how to communicate progress without triggering skepticism, regulatory scrutiny, or accusations of greenwashing. We develop a theoretical framework that extends voluntary disclosure theory by integrating reputational threat, explaining why highly active firms may greenhush. Using a panel dataset of 1,512 global companies from 2003 to 2022, we analyze the relationship between internal and external sustainability actions and find an inverted U-shaped pattern. Companies initially increase sustainability disclosure as internal efforts rise, but those with the most intensive sustainability activities reduce reporting—consistent with greenhushing. Moreover, high-reputation firms face heightened scrutiny, leading to greater perceived risks and lower thresholds for greenhushing. These insights reveal that regulatory pressure and fear of misinterpretation can distort corporate transparency.

Keywords:

Greenhushing; reputational threat; sustainability disclosure; internal and external sustainability actions

1. Introduction

In recent decades, corporations across the globe have expanded their voluntary corporate social responsibility (CSR) and environment, social, and governance (ESG) reporting. Today, thousands of companies—spanning more than 100 countries and constituting over two-thirds of global market capitalization—engage in such disclosure (Axjonow et al., 2018; KPMG, 2024; CDP, 2025). This trend is driven by stakeholder demands for transparency, strong societal norms, and the corporate pursuit of financial and reputational advantages, such as improved analyst forecasts (Al-Tuwaijri et al., 2004; Dhaliwal et al., 2011; Dhaliwal et al., 2012; Lys et al., 2015; Velte & Stawinoga, 2017). The benefits of voluntary disclosure nonetheless bring risks, as some firms seek to exaggerate their achievements or obscure failings through greenwashing (Delmas & Burbano, 2011; Lyon & Maxwell, 2011; Lyon & Montgomery, 2015).

While greenwashing has been widely recognized, its counterpart—greenhushing—has only recently drawn scholarly attention. Like greenwashing, greenhushing reflects an incongruence between internal and external sustainability actions[1] (Fig. 1, Aragón-Correa et al., 2016; Ginder et al., 2021). Yet in contrast to greenwashing, which involves overstating achievements, greenhushing refers to a firm's deliberate withholding of information about its sustainability actions and accomplishments, leading to insufficient external disclosure of genuine sustainability performance (Font et al., 2017; Rau & Yu, 2024; Eliwa et al., 2025). Unlike selective disclosure—which emphasizes positive messages while omitting negatives and is typically classified as greenwashing (Lyon & Maxwell, 2011)—greenhushing reflects a lack of incentive to alter stakeholder beliefs, resulting in voluntary silence. According to various case studies, greenhushing has been observed across industries (Burrows, 2020; Falchi et al., 2022). For instance, a World Economic Forum report noted that nearly 25% of 1,200 companies refrain from disclosing their science-based emission targets (Tao, 2024). These cases suggest that many companies prefer discretion to disclosure when facing a complex reputational environment.

{Insert Fig. 1}

[1] Here, the concept of external sustainability action is defined in terms of out-facing communicational efforts to gain legitimacy or organizational endorsement through CSR disclosure; and internal sustainability action is defined in terms of management engagements, operational reforms and initiatives that are internally oriented to embed sustainability (Hawn & Ioannou, 2016; Passetti et al. 2018; Gosselt et al., 2019).

Despite its significance, studies on greenhushing have primarily focused on qualitative and case-based accounts (Vallaster et al., 2012; Font et al., 2017; Carlos & Lewis, 2018; Ettinger et al., 2021; Falchi et al., 2022; Tao, 2024). A few have employed microeconomic modeling to theorize the mechanisms behind greenhushing, but robust quantitative evidence remains scarce (Kim & Lyon, 2015; Bond & Zeng, 2022; Hilton, 2025). Regarding sustainability disclosure, two dominant perspectives—legitimacy theory and voluntary disclosure theory—have long guided research (Patten, 2002; Clarkson et al., 2008; Huang et al., 2022). Yet neither framework fully captures the deliberate silence that characterizes greenhushing.

Building on these gaps, this study seeks to identify the underlying motivations of greenhushing through an integrated theoretical and empirical approach. We extend conventional disclosure theories into a unified microeconomic framework and derive testable hypotheses to explain when and why firms strategically under-communicate their sustainability efforts. We further incorporate reputational factors into our econometric framework to study how perceived reputational threats shape firms' disclosure choices.

Empirically, we construct variables capturing firms' external and internal sustainability actions following Hawn and Ioannou (2016), which allows us to distinguish between outward-facing initiatives and internal operational transformations. This distinction is critical when studying greenhushing, which fundamentally concerns the misalignment between these two dimensions (Testa et al., 2018a; Eliwa et al., 2025). In contrast, prior studies often rely on aggregated CSR or ESG ratings (El Ghoul et al., 2011; Ferri et al., 2023) or focus on specific quantitative metrics such as emissions performance or alignment with standards (Ding et al., 2023; Adibian et al., 2025). Our analysis reveals a nonlinear relationship between internal and external sustainability actions, consistent with our theoretical framework. Specifically, greenhushing emerges when the marginal reputational risks of disclosure outweigh its expected benefits.

The practical contributions of this study are threefold. First, it identifies reputational threat as a primary driver of greenhushing: firms may suppress sustainability communication when concerned that disclosure could trigger stakeholder misinterpretation or backlash. To minimize this perceived risk, they may forgo disclosure benefits and remain strategically silent. Second, the study offers implications for policymakers, suggesting that more stringent mandatory disclosure requirements and clearer guidance could reduce firms' hesitation to report under emerging international standards. Third, the findings provide insight for stakeholders such as

nongovernmental organizations (NGOs), underscoring the need to create an environment that encourages transparent corporate communication without punitive overreaction to disclosure efforts.

The rest of the article proceeds as follows. Section 2 reviews the related literature. Section 3 proposes a theoretical framework and develops hypotheses to capture the greenhushing phenomenon. Sections 4 and 5 describe and discuss the empirical models and results, respectively. Section 6 summarizes the conclusions and contributions of this study.

2. Literature Review

2.1. Strategic Silence Aimed at Avoiding Greenwashing Accusations

Previous studies have highlighted the significant drawbacks of greenhushing, characterized by limited disclosure—or even silence—on certain ESG-related issues. First, limited disclosure may be interpreted as poor environmental management, thereby diminishing recognition from stakeholders and undermining a firm's long-term value by eroding public credibility, customer loyalty, and brand reputation (Luo & Bhattacharya, 2009; Testa et al., 2018a; Tao, 2024). Second, limited disclosure may exacerbate information asymmetry, foster consumers' skepticism and negatively impact a firm's financial outcomes, such as its market value or profitability (Marquis et al., 2016; Cheng et al., 2024). Several factors contribute to this phenomenon, as discussed below.

A primary reason for limited ESG disclosure is that many companies lack awareness of the necessities and strategic implications of green reporting (Falchi et al., 2022). Vallaster et al. (2012) described organizations with limited ESG disclosure as unrecognized ethical businesses that fail to integrate sustainability into their brand image. Additionally, greenhushing occurs because companies may fear being perceived as greenwashers even when they genuinely align their sustainability credentials with customers' expectations (Ettinger et al., 2021). For example, in 2018, brands such as HSBC and Coca-Cola faced legal challenges for dubious sustainability claims, prompting well-performing companies to greenhush to avoid being accused of greenwashing (Hicks, 2022). Moreover, companies may adhere substantially to sustainability requirements but refrain from excessive external actions to avoid potential criticisms or pressures for further actions (Marquis & Qian, 2014; Testa et al., 2018b). Severe stakeholder

backlash can occur when companies voluntarily report on sustainability philanthropic behaviors while being found mistreating primary stakeholders with low wages or overtime enforcement (Wang et al., 2021). In addition, small companies may also engage in limited ESG disclosure for some other reasons, such as a lack of expertise and higher relative costs of data collection compared with large public companies (Wickert et al., 2016; Huang et al., 2025).

Another motivation for greenhushing is the strategic withholding of positive but less favorable information. Huang et al. (2022) suggested that companies may withhold some of their sustainability information to maintain legitimacy within the market. Delmas et al. (2013) further reported that companies may be rewarded for environmental processes (e.g., commitments to lower emissions) instead of actual outcomes (e.g., decreasing toxic releases or carbon footprints). Therefore, companies may emphasize their environmental commitments while withholding those positive but less favorable outcomes to enhance stakeholders' sustainability perceptions and gain market rewards (Flammer, 2013; Delmas et al., 2013).

2.2. Sustainability Reputation Affects Companies' Disclosure Behavior

Sustainability reputation is critical to a company's brand and standing in today's business landscape. A high sustainability reputation can confer significant competitive advantages, such as attracting talent, accessing new markets, and fostering customer loyalty (Kiron et al., 2012). However, it also introduces reputational threats, as a track record of sustainability credentials attracts more attention and raises stakeholders' expectations (McDonnell & King, 2013; McDonnell & Werner, 2016).

More reputable companies enjoy greater market visibility and broader recognition than their competitors, which may shield them against negative repercussions from ESG controversies (Reuber & Fischer, 2010; Aouadi & Marsat, 2018). Such visibility and recognition can enhance competence and market recognition amid reputational threats. However, excessive disclosure can also yield unintended consequences for firms, including perceptions of greenwashing, heightened stakeholder activism, and loss of consumer credibility (Delmas & Burbano, 2011; Schoeneborn & Vásquez, 2017; Falchi et al., 2022; Alyahia et al., 2024). In reality, companies may have imperfect information about their sustainability performance, particularly regarding activities not directly related to their operations, such as those conducted by their upstream suppliers. Revelations of suppliers engaging in activities that violate legal or ethical standards

can tarnish a firm's reputation, even if the firm itself adheres strictly to those standards. For example, the child labor found on cocoa farms supplying Nestlé in Côte d'Ivoire triggered intense consumer backlash and NGO activism (Clarke, 2015). Hence, companies may choose to withhold their sustainability achievements to secure financial resources and mitigate reputational threats.

Companies with high reputation typically need to maintain their public image and achieve regulatory and sustainability goals (Skard & Thorbjørnsen, 2014; Islam et al., 2025). Paradoxically, however, these companies might greenhush. For instance, empirical evidence shows that companies with strong sustainability reputations face harsher backlash if their disclosures lead consumers to question their product quality, or whether parts of their operations contradict their sustainability claims (Coburn, 2019). This leads to costly perceptions of hypocrisy, prompting these highly reputable companies to choose "strategic silence" to protect their public image and reduce the risk of being perceived as greenwashers (Carlos & Lewis, 2018). Huang et al. (2025) further highlighted that sustainability reporting is strongly influenced by the extent of security analysts' coverage of a company, or its "organizational status". Rather than focusing on the attention companies receive as a driver, we examine how internal sustainability actions influence the trade-off between benefits of external actions and costs of reputational threats. Additionally, unlike some previous studies that focus primarily on how reputation affects the cost of reporting (e.g., Carlos & Lewis, 2018), we further explore how reputational threats impact the complex relationships between companies' internal and external sustainability actions.

3. Theoretical Framework and Hypotheses Development

3.1. From Legitimacy and Voluntary Disclosure Theories to Greenhushing

Two conventional theories are widely used to explain companies' incentives for sustainability disclosure: legitimacy theory and voluntary disclosure theory. Legitimacy theory postulates that companies perceived as having poorer sustainability performance, especially those in more environmentally sensitive industries, disclose more to align with societal expectations (Deegan, 2002; Patten, 2002). Conversely, voluntary disclosure theory suggests that companies with better sustainability performance are incentivized to disclose more information to signal their managerial and practical strengths in sustainability (Li et al., 1997; Clarkson et al., 2008). Few

previous empirical studies have attempted to reconcile the contrasting predictions between the two theories by evaluating the incentives behind voluntary disclosure. While most studies focus primarily on disclosure quantity, these few studies suggest that well-governed companies disclose high-quality information voluntarily to signal their outstanding performance, whereas poorly-governed companies disclose low-quality information to maintain their legitimacy (Hummel & Schlick, 2016; Haque & Ntim, 2018).

However, both theories face challenges in explaining greenhushing. First, legitimacy theory offers a lopsided prediction of the disclosure behaviors of companies with poor sustainability reputations due to political and social pressures (Patten, 2002). Therefore, legitimacy theory is not appropriate to explain greenhushing, as highly reputable and well-governed companies are believed to engage in greenhushing more extensively. Second, the use of voluntary disclosure theory also faces challenges in explaining greenhushing. It intuitively posits that highly reputable companies disclose more information, which directly contradicts the deliberate silence characteristic of greenhushing. Additionally, increasingly stringent mandatory ESG disclosure requirements have reduced information asymmetry and enhanced transparency, leaving less room for voluntary disclosure on sustainability practices (Liao et al., 2021). Furthermore, voluntary disclosure theory rests on a strong underlying assumption: stakeholders take companies' sustainability disclosures at face value and make direct inferences about their sustainability governance. In practice, however, such inferences and their consequences are subject to uncertainty amid stakeholders' scrutiny. Therefore, incorporating this uncertainty into the traditional theory offers the potential to explain greenhushing with a new theoretical framework.

3.2. Theoretical Framework for Greenhushing

The purpose of our new framework is to extend voluntary disclosure theory to reconcile the two contradictory phenomena of voluntary disclosure and greenhushing, or deliberately downplaying sustainability achievements. Unlike Huang et al. (2022), who tried to reconcile greenhushing with legitimacy theory, we propose that greenhushing stems from the uncertainty in the outcomes of stakeholder scrutiny on companies' sustainability disclosure. We present a microeconomic model to investigate how companies optimize the trade-off between the marginal benefits from additional external sustainability communication, and the marginal costs associated with the increased outcome uncertainty from stronger stakeholder scrutiny. In

line with Kolk and Pinkse (2010), the basic assumption is that investors, or other stakeholders, value sustainability governance, which is the capacity for companies to oversee and manage their sustainability-related risks and opportunities. Strong sustainability governance is pivotal for investors, as it enhances financial resilience and aligns with long-term value creation. However, as sustainability governance is not publicly observable, investors may turn to leveraging a company's observable sustainability initiatives to infer its underlying level of sustainability governance.

In our model, listed companies are divided into two types, $\theta \in \{H, L\}$, referred to as high type and low type with stronger or weaker sustainability governance, respectively. Among companies with η internal sustainability initiatives, a fraction $x_\eta \in (0,1)$ of these companies have strong sustainability governance, whereas the rest have weak governance. We assume that x_η increases with η, so investors can have higher prior belief that companies with more sustainability initiatives have stronger sustainability governance. Although investors value a company's actual type, they cannot directly observe it but form rational expectations from available information. Companies also care about how investors see their type, as a high type signals a greater likelihood of achieving better sustainability outcomes and helps maintain their reputational legitimacy.

Let $\delta \in [0,1]$ denote the high-type company's level of external actions, which generates a cost of $\frac{1}{2}\delta^2$. Here, we assume that low-type companies fully mimic high-type companies' strategy of external actions to avoid being perceived as weak in sustainability governance. Otherwise, a separating equilibrium with differing external actions is reached, which fully reveals the type of company. Therefore, the low-type companies also follow the high-type companies' decision to avoid being identified, resulting in a pooling equilibrium.

In general, companies are more likely to be scrutinized if they exert more external actions. Here, we assume that a company exerting δ level of external actions is scrutinized by stakeholders with probability δ for simplicity. Upon scrutiny, stakeholders form posterior assessments regarding the type—or the sustainability governance level—of a company. Stakeholders may reproach the sustainability performance of the company if they find some of its internal sustainability actions as unsustainable, greenwashing, or simply misaligning with their expectations. The likelihood of a company's sustainability performance being assessed as

satisfactory or reproachable under stakeholder scrutiny is contingent on its type. If a high-type company is scrutinized, its sustainability performance is deemed satisfactory (S) with probability $\alpha \in (0,1)$ but reproachable (R) with probability $1-\alpha$. If a low-type company is scrutinized, with a parameter $\phi \in (0,1)$, its sustainability performance is deemed satisfactory (S) with probability $\alpha\phi$ but reproachable (R) with probability $1-\alpha\phi$. That is, the sustainability performance of a low-type company is more likely to be reproachable than that of a high-type company. The uncertainty of investigation outcomes for different types of companies is the absent factor in traditional voluntary disclosure theory.

According to Bayes' theorem and the assumption that the low-type company imitates the high-type one, a satisfactory outcome leads to the posterior belief:

$$Pr(H|S,\eta) = \frac{Pr(S|H,\eta)\,\Pr(H|\eta)}{\Pr(S|H,\eta)\,\Pr(H|\eta) + \Pr(S|L,\eta)\,\Pr(L|\eta)} = \frac{\alpha x_\eta}{\alpha x_\eta + \alpha\phi\big(1-x_\eta\big)}$$

Similarly, a reproachable outcome leads to the posterior belief:

$$Pr(H|R,\eta) = \frac{Pr(R|H,\eta)\,\Pr(H|\eta)}{\Pr(R|H,\eta)\,\Pr(H|\eta) + \Pr(R|L,\eta)\,\Pr(L|\eta)} = \frac{(1-\alpha)x_\eta}{(1-\alpha)x_\eta + (1-\alpha\phi)\big(1-x_\eta\big)}$$

Finally, if a company is not scrutinized, stakeholders rely on their prior belief $Pr(H|\eta) = x_\eta$ to judge the level of sustainability governance. The setting of the theoretical framework is illustrated in Fig. 2.

{Insert Fig. 2}

All companies aim to maximize their reputation as high-type companies while accounting for publicity costs. Formally, the high type chooses $\delta \in [0,1]$ to maximize its objective function:

$$\pi(\delta) = (1-\delta)Pr(H|\eta) + \delta\big(\alpha Pr(H|S,\eta) + (1-\alpha)Pr(H|R,\eta)\big) - \frac{\delta^2}{2}$$

Solving this problem yields the optimal level of external actions as follows:

$$\delta^* = \frac{\alpha x_\eta\big(1-x_\eta\big)^2(1-\phi)^2}{\Big(x_\eta + \phi\big(1-x_\eta\big)\Big)\Big(1-\alpha\Big(x_\eta + \phi\big(1-x_\eta\big)\Big)\Big)}$$

The proof in the online supporting information (SI) indicates that δ^* is single peaked at some $x_\eta \in (0,1)$, as shown in Fig. 3. Since x_η is increasingly in η (the number of a company's sustainability initiatives), there exists a threshold $\bar{\eta}$ such that δ^* increases in η for $\eta < \bar{\eta}$ but decreases for $\eta > \bar{\eta}$.

{Insert Fig. 3}

Such a nonmonotonic relationship partially addresses our research questions. Companies with the fewest sustainability initiatives have little to lose and nothing to gain from additional environmental disclosure. However, once they begin implementing substantive internal sustainability actions, they become incentivized to improve their company image and show their sustainability commitments, thereby increasing their external actions. In contrast, companies with a track record of sustainability initiatives have a strong safety net of prior stakeholder belief. Under scrutiny, the marginal benefits of further disclosure are minute, whereas the expected costs of being associated with reproachable sustainability performance outweigh those benefits. Therefore, it is optimal for such companies to partially withhold disclosure of their sustainability initiatives—and to do so to a greater extent as their internal sustainability actions increase.

3.3. Hypothesis Development

The theoretical model predicts an inverted U-shaped relationship between a company's optimal level of external sustainability actions (δ^*) and its internal sustainability actions (η). As firms begin to implement internal sustainability initiatives, they consider a trade-off: the diminishing marginal benefits derived from additional external engagement versus the increasing marginal costs associated with public scrutiny and reputational exposure. This dynamic gives rise to a critical threshold of internal sustainability actions, denoted by $\bar{\eta}$ in the model, at which the relationship between internal and external actions reverses.

When internal actions are below this threshold ($\eta < \bar{\eta}$), the marginal benefits of further external engagement continue to outweigh the risks, so greater internal efforts are associated with increasing external actions. Conversely, once internal actions surpass the threshold ($\eta > \bar{\eta}$), the marginal costs of scrutiny escalate and may exceed the benefits, prompting firms to strategically restrain their external sustainability actions as internal engagement intensifies. Thus, the model highlights both the initial positive association and subsequent negative association—key features of the inverted U-shaped relationship. Based on this theoretical development, we propose:

Hypothesis 1a: For companies with internal sustainability actions below the critical threshold, an increase in internal actions is associated with an increase in external sustainability actions.

Hypothesis 1b: For companies with internal sustainability actions above the threshold, an increase in internal actions is associated with a decrease in external sustainability actions.

The preceding set of hypotheses addresses only the behavioral relationship between internal and external sustainability actions. However, a core proposition of our theoretical model is that greenhushing is fundamentally driven by concerns over reputational threats. To empirically identify this causal mechanism, it is necessary to incorporate factors such as a company's sustainability reputation and its exposure to reputational risk—factors that are not directly modeled but are empirically salient. Firms with stronger sustainability reputations, reflected also in fewer public controversies, often experience heightened visibility and scrutiny, resulting in greater perceived reputational risk. Consequently, the threshold at which the inverted U-shaped relationship between internal and external sustainability actions reverses is likely to be lower for highly reputable firms. In other words, companies with greater reputations may begin greenhushing at a lower level of internal sustainability actions. Integrating these insights from both the theoretical framework and extant literature, we propose the following additional hypotheses:

Hypothesis 2a: Companies with higher sustainability reputations and fewer public controversies are associated with lower levels of external sustainability actions.

Hypothesis 2b: Firms with higher reputations and fewer controversies are likely to begin greenhushing at lower levels of internal sustainability actions, reflecting a lower threshold after which strategic silence becomes optimal.

4. Empirical Analysis

4.1. Data and Sample

To investigate the proposed hypotheses, this study assembles a dataset from two databases:

Compustat: Data on companies' financial statements, including balance sheets, income statements, and annual stock performance reports.

ASSET4 (LSEG): Data on ESG-related ratings and raw ESG information. Details on how the raw data are transformed into unit-consistent and auditable data can be found in Hawn and Ioannou (2016).

The sample includes 1,512 listed companies from the STOXX Global 1800 index, after excluding those with missing information from 2003 to 2022. The resulting sample comprises 18,747 firm-year observations. Additionally, a one-year lag is applied to all the independent and control variables unless otherwise noted, reducing the number of observations to 17,012. Variable sources and definitions are provided in SI Table S1.

4.2. Dependent Variable

Based on the proposed hypotheses, the key dependent variable is a standardized score for external sustainability actions (Ext), representing sustainability disclosure, as defined in Footnote 1. Ext, adapted from Hawn and Ioannou (2016), is constructed from yes/no answers to 24 questions and normalized on a 0–1 scale. Examples of questions include whether the company has reported its initiatives to reduce, substitute, or phase out greenhouse gases, and whether it has publicly endorsed or followed global standards such as the Global Sullivan Principles, the UN Global Compact, or the OECD guidelines. Ext equals 0 for companies with no external actions, and 1 for those with all the 24 external actions. Hence, this measure reflects both the quality of a company's sustainability disclosure and its willingness or capacity to collect and report environmental initiatives.

4.3. Independent Variables

The score of internal sustainability actions (Int), also defined in Footnote 1, is a key independent variable paired with Ext. Following Hawn and Ioannou (2016), Int is constructed from yes/no answers to 21 questions and is normalized on a 0–1 scale. Examples of questions include whether the company has enacted any policy to improve the health and safety of its employees, whether it has a CSR committee, whether it has committed to pollution reduction, and whether it has adopted any environmental criteria such as ISO14000 or energy

consumption to select its suppliers. Int equals 0 for companies with no internal actions, and 1 for those with all the 21 internal actions. Noticeably, this variable is more suitable for our analysis than other common CSR scoring metrics are. It captures solely internal sustainability performance but excludes those external-oriented initiatives to gain organizational endorsement or public recognition.

The ESG controversies score ($ESGCScore$) is an auxiliary independent variable. It is industry-benchmarked to ensure comparability and is calculated based on 23 controversial ESG topics to assess a company's sustainability reputation (Nirino et al., 2021). $ESGCScore$ equals 100 for companies with no controversies, and 0 for those involved in all 23 controversial topics.

4.4. Control Variables

To rule out alternative explanations of our findings, we control several firm-level factors that may influence a company's external actions. Company size, measured as the natural logarithm of market value ($ln(MV)$), is controlled, as company size is found to be positively related to environmental disclosure likelihood (Lewis et al., 2014; Eng et al., 2022). The proportion of fixed assets to total assets (PPE) is controlled, as fixed assets contribute to more CO_2 emissions because of higher production capacity (Bolton & Kacperczyk, 2025). R&D expenditure scaled by total net sales ($R\&D/Sales$) serves as a proxy for intangible assets, as it may affect financial performance and information asymmetry (Koh et al., 2018; Pennetier et al., 2019). The leverage ratio ($Debt/Capital$) is controlled, as it may influence a company's CSR behaviors through the risks and costs associated with its capital structure (Bae et al., 2019). The cash flow scaled by sales is also controlled ($Cash\ Flow/Sales$), as lower cash flow indicates more limited financial flexibility and resources for ESG activities (Cheng et al., 2024). Furthermore, we also control firm age (Age), measured as the number of years since the date of incorporation (Collevecchio et al., 2025). Specifically, Age is not lagged in all subsequent analyses.

In addition to financial indicators, we also include two dummy control variables (yes = 1). First, CEO duality ($CEOid$) indicates whether the CEO is a member of the board of directors, as some organizations prefer to separate the roles of the CEO and board members to ensure independent oversight and avoid potential conflicts. Second, a change in organizational structure ($ChangeOrgStruc$) indicates whether significant organizational changes (e.g.,

mergers, spinoffs) were reported by the board in the focal year's financial reports. These variables account for factors that may influence a company's capacity or motivation to engage in external actions (Lozano et al., 2016; Naciti, 2019).

To address the effects of unobserved heterogeneity and potential endogeneity issues, we incorporate region, year, industry, and company fixed effects (FE) in various combinations. In addition, robust standard errors are clustered at the company level to correct for company-specific autocorrelation in the estimation of the standard errors.

4.5. Econometric Specifications

To test the first set of hypotheses, we examine the relationship between Int and Ext (internal and external sustainability actions). To identify greenhushing, we divide Int into deciles based on its value to test whether a threshold decile exists after which the trend of greenhushing is observed. Hence, *Int* is divided into ten deciles, encompassing values from the first decile of 0–1 to the tenth decile of 9–10. We construct ten dummy variables, denoted as $Int\ Decile\_X$ $(X = 1, 2, \dots, 10)$, indicating whether the $Int_{i,t}$ of company i in year t can be categorized into either decile. For example, if $Int_{i,t}$ belongs to the fifth decile of 4–5, $Int\ Decile\_5_{i,t}$ is equal to 1, while the other nine dummy variables equal 0. Importantly, $Int\ Decile\_1$ is excluded to avoid multicollinearity. The regression model can be posited as (E1):

$$Ext_{i,t} = \beta_0 + \sum_{X=2}^{10} \beta_{X-1}\,(Int\ Decile\_X_{i,t-1}) + \beta_{10} Controls_{i,t-1} + FE + \varepsilon_{i,t} \qquad (E1)$$

Under the conventional voluntary disclosure model, we would expect β_i $(i = 1, 2, \dots, 9)$ to increase with i, as better internal sustainability performance incentivizes greater voluntary disclosure. However, as predicted by Hypotheses 1a and 1b, we expect a peak β_i value exists at an intermediate decile, beyond which companies with outstanding internal sustainability performance exhibit reduced incentives for external actions. Additionally, FE includes combinations of region, industry, year, and company fixed effects, and $\varepsilon_{i,t}$ is the error term.

To further test the first set of hypotheses, which predict a quasiconcave relationship between Int and Ext, we include a nonlinear term for Int. Here, a quadratic term is applied for simplicity:

$$Ext_{i,t} = \beta_0 + \beta_1 Int_{i,t-1} + \beta_2 Int_{i,t-1}^2 + \beta_3 Controls_{i,t-1} + FE + \varepsilon_{i,t} \quad (E2)$$

To examine Hypotheses 2a, we extend the model by including $ESGCScore$ to see how it influences the external actions:

$$Ext_{i,t} = \beta_0 + \beta_1 Int_{i,t-1} + \beta_2 Int_{i,t-1}^2 + \beta_3 ESGCScore_{i,t-1} + \beta_4 Controls_{i,t-1} + FE + \varepsilon_{i,t} (E3)$$

Based on the nature of the variables, Hypotheses 1a and 1b can be validated with the following four prerequisites held in (E2) and (E3): (i) $\beta_2 < 0$; (ii) $0 < -\frac{\beta_1}{2\beta_2} < 1$; (iii) $\beta_1 > 0$; and (iv) $\beta_1 + 2\beta_2 < 0$. These prerequisites ensure an inverted U-shaped relationship, with a turning point within the 0–1 range of *Int* and positive and negative slopes at the lower and upper boundaries, respectively (Lind & Mehlum, 2010; Haans et al., 2016). For Hypothesis 2a, we expect $\beta_3 < 0$ in (E3), indicating that higher reputations are associated with reduced external actions. For Hypothesis 2b, we expect that companies with higher reputations may start greenhushing at lower levels of internal sustainability actions, compared with those with lower reputations. Hence, when (E2) is regressed with companies where $ESGCScore = 100$, an inverted U shape with a lower turning point is observed compared with those where $ESGCScore < 100$.

For further analysis, the ESG controversies score can be adjusted to a dummy variable ($dummyESGCScore$), where it is defined as 1 when $ESGCScore = 100$ and 0 when $ESGCScore < 100$. On this basis, we construct a regression equation:

$$Ext_{i,t} = \beta_0 + \beta_1 Int_{i,t-1} + \beta_2 Int_{i,t-1}^2 + \beta_3 dummyESGCScore_{i,t-1}$$
$$+\beta_4 Int_{i,t-1} \times dummyESGCScore_{i,t-1} + \beta_5 Int_{i,t-1}^2 \times dummyESGCScore_{i,t-1}$$
$$+\beta_6 Controls_{i,t-1} + FE + \varepsilon_{i,t} \quad (E4)$$

For Hypothesis 2a, we expect $\beta_3 < 0$. For Hypothesis 2b, the following four prerequisites should be met: (i) β_2, $\beta_2 + \beta_5 < 0$; (ii) $0 < -\frac{\beta_1+\beta_4}{2(\beta_2+\beta_5)} < -\frac{\beta_1}{2\beta_2} < 1$; (iii) β_1, $\beta_1 + \beta_4 > 0$; and (iv) $\beta_1 + 2\beta_2$, $\beta_1 + \beta_4 + 2(\beta_2 + \beta_5) < 0$. Similar to (E3), these prerequisites yield a significant inverted U-shaped relationship between Ext and Int, with a lower turning point for companies with higher reputation and fewer ESG controversies ($ESGCScore = 100$).

5. Results

5.1. Descriptive Statistics

Panel A of Table 1 presents descriptive statistics for the variables used in the regression analysis. Four variables, $ln(MV)$, PPE, $Cash\ Flow/Sales$, $R\&D/Sales$, and $Debt/Capital$, are winsorized at the 99th percentile to limit the influence of outliers. The mean values for external actions (Ext) and internal sustainability actions (Int) are 0.64 and 0.41, respectively, which are both slightly lower than the median values of 0.67 and 0.42, respectively. This suggests that more sample companies exert above-average efforts on external and internal sustainability actions. The mean and median values of the ESG Controversies Score ($ESGCScore$) are 85.33 and 100, respectively, indicating that most of the listed companies in this study have high sustainability reputation and few public ESG controversies over the past two decades. In addition, it can be inferred that approximately 85% of the observations have CEOs as board members, and only 1.5% experience board structure changes.

Panel B of Table 1 presents the Pearson correlation coefficients among all the variables in the following analysis. There is a generally positive and significant correlation between Ext and Int. The correlation coefficients are mostly below 0.3, indicating a limited risk of multicollinearity bias. Additionally, variance inflation factors (VIFs) are calculated for all the variables. The VIFs are all less than 3, indicating that our results do not suffer from multicollinearity.

{Insert Table 1}

5.2. Results of the Regression Analyses

The results of the multivariate regression analyses based on regression model (E1) are presented in Table 2. Six sets of regression results with the same set of variables but different combinations of fixed effects and the lag of the dependent variable (Ext) are considered. When the lag of Ext is not controlled (Columns (1) and (2)), a strictly positive relationship with a decreasing slope between Int and Ext is observed, which aligns with voluntary disclosure theory. However, when the lag of Ext is controlled with different fixed-effect combinations to capture more stringent baseline results, as shown in Columns (3) to (6), an inverted U-shape between the two variables can be observed. The peak (threshold) value occurs at the sixth (5–6) decile of Int. The results of the Wald test further indicate significant differences in the

regression coefficients of the dummy variables for $Int\ Decile$ ($p < 0.05$). Therefore, it suggests that companies' external actions may increase with internal sustainability actions for companies with internal actions below the critical threshold but decrease for those with internal actions above the critical threshold. For better visualization, the coefficients of the regressions of *Ext* on the dummy variables for the Int deciles found in Columns (1), (2), (3), and (6) are plotted in Fig. 4. The findings from regression model (E1) indicate a significant quasiconcave relationship between internal and external sustainability actions, which is consistent with Hypotheses 1a and 1b regarding greenhushing.

{Insert Table 2}
{Insert Fig. 4}

The abovementioned quasiconcave relationship is further evaluated with quadratic regression models (E2) and (E3), where Int^2 is considered. The results, shown in Columns (1) to (6) of Table 3, test Hypotheses 1a and 1b. Columns (1) to (4) hold the same variables but differ in the combinations of year, region, and industry fixed effects. Columns (5) and (6) incorporate company fixed effects, and the lag of Ext is included in Column (6) to account for autocorrelation of the dependent variable. As tested, the abovementioned four prerequisites to test the robustness of the inverted U-shaped relationship are met for the first six columns. Moreover, the turning points are approximately 0.80 in Columns (1) to (4). The turning point decreases slightly to 0.72 when company fixed effects are controlled and further decreases to 0.45 when the time-dependence of Ext is controlled. This pattern is consistent with an interpretation that greenhushing can emerge as an equilibrium strategy when companies' internal sustainability actions increase above a certain critical threshold. This is potentially due to their concerns about losing credibility and thereby lacking incentives to improve sustainability performance. This finding further indicates a significant quasiconcave relationship between internal and external sustainability actions, as proposed in Hypotheses 1a and 1b.

To investigate whether the inclination to engage in greenhushing varies with different levels of reputational threat, we propose Hypotheses 2a and 2b. ESG Controversies Score ($ESGCScore$) is introduced as a new variable in Columns (7) to (10) of Table 3 using regression model (E3). The correlation coefficients for Int and Int^2 as well as the turning point values remain

approximately unchanged. The correlation coefficient of $ESGCScore$ is strictly negative at approximately -0.00026 when company fixed effects are excluded. That is, for the same level of internal sustainability actions, a company's external actions are 2.6% lower when it has a high reputation ($ESGCScore = 100$) than when it has a low reputation ($ESGCScore = 0$). This finding aligns with Hypothesis 2a, which states that companies' reputations are negatively associated with their external sustainability actions. However, the correlation coefficient of $ESGCScore$ is not significant when company fixed effects are controlled (Columns (9) and (10)). This is likely due to the limited within-firm variation in $ESGCScore$ over time, which constrains the potential to detect its effect on external actions when controlling company fixed effects.

{Insert Table 3}

Hypothesis 2b is tested with two approaches: (1) regression model (E2) with two subsamples ($ESGCScore = 100$ and $ESGCScore < 100$), and (2) regression model (E4), which considers interaction terms between Int and $ESGCScore$ (a dummy variable $dummyESGCScore$ is considered). The results of the first approach are shown in Table 4: Panel A shows the regression outcomes for companies with an $ESGCScore = 100$, i.e., a higher reputation with no controversies in a given year. Panel B corresponds to companies with an $ESGCScore < 100$, i.e., a lower reputation with controversies in that year. In both paths, the regression coefficients for Int^2 are significantly negative, thus confirming an inverted U-shaped relationship consistent with our previous findings. For companies with $ESGCScore = 100$, the average turning point value is 0.79 without controlling company fixed effects (Columns (1) to (4) of Panel A). The values decrease to 0.72 and 0.41 when company fixed effects and the lag of Ext are controlled respectively (Columns (5) and (6) of Panel A). However, Panel B shows that the turning point values for companies with $ESGCScore < 100$ are higher than those in Panel A, with the statistically significant differences ranging from 0.05 to 0.13. This suggests that companies with a higher reputation and fewer controversies are more likely to adopt greenhushing as their optimal strategy at lower levels of internal sustainability actions. For better visualization, how the turning point changes when the $ESGCScore$ shifts from below 100 to 100 is shown in Fig. 5. The statistical results are consistent with Hypothesis 2b.

{Insert Table 4}

{Insert Fig. 5}

The results with the second approach, or regression model (E4), are presented in Table 5 to strengthen our tests for Hypotheses 2a and 2b. From Columns (1) to (4) when company fixed effects are not considered, we find that external actions (Ext) decrease by approximately 3.9% and 6.2% when region fixed effects are and are not controlled, with a 1% significance level for companies with higher reputation ($dummyESGCScore = 1$). Additionally, the turning points of inverted U shape between internal and external sustainability actions are 0.05 lower for companies with higher reputation. These two findings are consistent with Hypotheses 2a and 2b respectively. However, when company fixed effects are considered (Columns (5) and (6)), such differences are less significant, probably because of the low within-firm variation in $ESGCScore$ over the years. Overall, our tests in this section support both Hypotheses 1 and 2.

{Insert Table 5}

5.3. Supplementary Regression Analyses

Based on the analyses presented above, it is significant that external sustainability actions (Ext) first increase but then decrease as internal sustainability actions (Int) increase. That is, companies may greenhush when their internal actions exceed a certain threshold. However, this finding may be disputed, as both Ext and Int could capture the same underlying concept of "corporate greenness", resulting in rather high t statistics. Hawn and Ioannou (2016) noted that the two variables measure distinct types of CSR actions, where the external actions focus on communication and claim to influence external stakeholders, and the internal actions focus on internal policies and the implementation of CSR. The Cronbach's alpha test results of more than 0.7 and VIFs of less than 3 for all variables suggest strong internal consistency, indicating that Int and Ext capture distinct underlying concepts. To address potential endogeneity in panel regressions, company fixed effects and the lag of the dependent variable (Ext) are considered in the above analysis. This can help control for any time-invariant company characteristics as well as the dynamic effect where past external actions might influence current external actions. Specifically, when company fixed effects and the lag of the independent variable are controlled, both the correlation coefficients for the independent variables and R^2 increase (Tables 3 to 5), indicating the robustness of our findings.

To confirm the robustness of regression model (E2), we centered the independent variables of regression model (E2) with the average value of *Int* (model (E5)) for regression, and the turning point value for *Int* can be calculated as $\left(\overline{Int}_{t-1} - \frac{\beta_1}{2\beta_2}\right)$. Centering reduces numerical instability due to multicollinearity and enhances the effect of the independent variable (Int) on the dependent variable (Ext) when control variables are included (Afshartous & Preston, 2011).

$$Ext_{i,t} = \beta_0 + \beta_1\left(Int_{i,t-1} - \overline{Int}_{t-1}\right) + \beta_2\left(Int_{i,t-1} - \overline{Int}_{t-1}\right)^2 + \beta_3 ESGCScore_{i,t-1} + \beta_4 Controls_{i,t-1} + FE + \varepsilon_{i,t} \quad (E5)$$

The results are shown in Table 6. Compared with the results from regression model (E2) of Table 3, the turning point values differ by at most 0.01 for Columns (1) to (4) when company fixed effects are not controlled. Moreover, a significant inverted U-shaped relationship between Ext and Int can also be observed in all columns of Table 6. These results suggest that the critical threshold value at which companies switch to greenhushing remains consistent.

{Insert Table 6}

We conducted two additional robustness tests in this study. First, Int is lagged by 2 and 3 periods to minimize the endogenous correlation between the dependent and independent variables (model (E6)).

$$Ext_{i,t} = \beta_0 + \beta_1 Int_{i,t-X} + \beta_2 Int_{i,t-X}^2 + \beta_3 ESGCScore_{i,t-1} + \beta_4 Controls_{i,t-1} + FE + \varepsilon_{i,t} \ (X = 2, 3) \quad (E6)$$

The results are shown in SI Table S2. Given the same controlled variables, the t-statistics of Int and Int^2 decrease by 10% to 20% when year, industry, and region fixed effects are controlled, while the turning points slightly drops but remains roughly unchanged. When company fixed effects and lag of Ext are controlled, the p values for Int and Int^2 are still far lower than 0.01 despite a sharp decrease in the t statistics.

Second, year, industry or regional average values of Int and Int^2 are applied as instrumental variables in the regression to address endogeneity issues. This includes concerns such as *Int* not fully capturing the internal sustainability actions of a company or the bilateral causality between Int and Ext. Regression model (E7) with instrumental variables is as follows:

$$\widehat{Int}_{i,t-1} = \alpha_0 + \alpha_1 \overline{Int}_{[X],t-1} + \alpha_2 Controls_{i,t-1} + FE + \varepsilon_{i,t}$$

$$\widehat{Int^2}_{i,t-1} = \gamma_0 + \gamma_1 \overline{Int^2}_{[X],t-1} + \gamma_2 Controls_{i,t-1} + FE + \varepsilon_{i,t}$$

$$Ext_{i,t} = \beta_0 + \beta_1 \widehat{Int}_{i,t-1} + \beta_2 \widehat{Int^2}_{i,t-1} + \beta_3 Controls_{i,t-1} + FE + \varepsilon_{i,t} \quad (E7)$$

where $\overline{Int}_{[X]}$ and $\overline{Int^2}_{[X]}$ refer to the mean values of Int and Int^2, respectively, based on specific criteria of year (y), industry (i) and region (r). For example, while $X \in \mathcal{P}(\{y, i, r\})$, $\overline{Int}_{[yir]}$ denotes the mean value of Int given the same year, region and industry. These estimated values, $\widehat{Int}_{i,t-1}$ and $\widehat{Int^2}_{i,t-1}$, are then used to estimate the dependent variable, with the results presented in SI Table S3. Here, combinations of $\{y, i\}$, $\{y, r\}$, and $\{y, i, r\}$ are selected for X to construct the instrumental variables. The results from all six columns indicate that the correlation coefficients for the independent variables estimated by the instrumental variables are significant regardless of whether fixed effects are controlled. The t-statistics for these constructed independent variables are considerably smaller than the original Int and Int^2. The four prerequisites to test the robustness of the inverted U-shaped relationship are also met, and the results can still capture the greenhushing behavior in companies with high internal sustainability actions. Furthermore, even after including company fixed effects in Columns (2), (4) and (6), greenhushing remains the optimal strategy for companies whose internal sustainability efforts exceed a certain threshold.

To further investigate the mechanism behind the interaction between a company's reputational threat and its greenhushing potential, we examine how the turning point values for Ext change across subsamples based on $Debt/Capital$ and PPE. Similar to the approach in Table 4, we separate the data into two subsamples based on the value of a financial parameter below or above the median value of the variable, where the median is defined within each year. In Table 7, we statistically tested the differences in turning point values between the two subsamples. Significant differences in the turning points can be observed when $Debt/Capital$ and PPE are controlled.

First, a lower turning point value, indicating a company's greater likelihood of engaging in greenhushing, is found for companies whose $Debt/Capital$ (leverage ratio) is below the median when year or year-industry fixed effects are controlled. According to the trade-off theory of capital structure, lower leverage ratios indicate higher risk levels for companies (Frank & Goyal, 2009). Companies with high risk are more likely to engage in greenhushing due to greater reputational threats or a lower capacity to withstand additional risk. Second, companies with higher proportions of fixed assets (PPE) are found to greenhush more.

Generally, stakeholders naturally associate higher fixed asset shares with greater investment in factories and machinery, more intensive manufacturing, higher CO_2 emissions (Dong et al., 2022; Bolton & Kacperczyk, 2025). Therefore, such companies, which are more likely to be perceived as being less sustainable, are more vulnerable to reputational threats and thereby more likely to greenhush.

{Insert Table 7}

6. Conclusion

While many studies have explored greenwashing and general ESG disclosure practices, the emerging phenomenon of greenhushing, which is the deliberate undercommunication of sustainability actions, remains largely underexplored. Our study primarily aims to systematically address the empirical puzzles of the motivations underlying greenhushing. The findings of our study shed light on the complex and nuanced relationship between companies' internal sustainability actions and external actions. They also provide new insights into the motivation behind greenhushing, highlighting that reputational threat is among the key factors leading to greenhushing.

Two well-established theories on nonfinancial disclosure—voluntary disclosure theory and legitimacy theory—provide context for this study. However, greenhushing falls outside the scope of legitimacy theory and is contrary to what voluntary disclosure theory predicts. Therefore, we construct a succinct microeconomic framework to elucidate the mechanism of greenhushing. When a firm's internal sustainability actions are limited, the marginal benefits of further external engagement outweigh the risks, so it increases disclosure to benefit from reputational gains. Once internal actions surpass a certain threshold, the marginal costs of scrutiny outweigh the benefits, prompting the firm to reduce disclosure as internal engagement intensifies. Conclusively, the model highlights an inverted U-shaped relationship between internal and external sustainability actions, and the turning point indicates the threshold after which greenhushing becomes optimal.

This model is empirically tested with a panel dataset of all 1512 listed companies in the STOXX Global 1800 index but excluding those with missing information from 2003 to 2022. The

econometric analysis further corroborates the inverted U-shaped relationship between two normalized indices: external and internal sustainability actions. This finding is consistent with anecdotal evidence that greenhushing often occurs in some well-known companies with a strong commitment to sustainability.

Furthermore, the analysis shows that sustainability reputation matters for companies' disclosure decisions. Companies with better sustainability reputations and fewer environmental controversies, proxied by higher ESG controversies scores, exhibit a lower threshold for undertaking greenhushing strategies. A higher reputation may result in greater reputational threats and greater scrutiny risks. Excessive scrutiny may increase the risk of false recognition and miscommunication with stakeholders, thus increasing companies' likelihood of being perceived as a greenwasher and incentivizing greenhushing.

These findings yield two generalized conclusions. First, greenhushing is an equilibrium strategy when reputational threats eclipse disclosure incentives. Second, the study identifies reputational threats as key drivers, with more reputable companies being more likely to greenhush to avoid scrutiny or perceptions of greenwashing. Their track records of sustainability initiatives have already created a strong safety net of prior stakeholder belief which may be jeopardized by thorough disclosure. Practically, these conclusions suggest that policymakers should adopt more stringent ESG disclosure standards to stimulate more comparable and comprehensive disclosure practices. This can reduce the risks from excessive scrutiny and false recognitions and further encourage transparency without penalizing the genuine efforts of companies. Additionally, stakeholders such as NGOs should balance critical analysis and an environment for companies to safely disclose their internal sustainability actions.

Finally, this study has limitations that pave the way for future research. First, given the constantly changing reputational threats and policy environments, the theoretical framework may not capture the dynamics of a company's disclosure strategy. Second, the dataset for empirical analysis might not fully represent industry or regional variations in greenhushing behavior. The dataset overlooks the massive number of small-and-medium-sized enterprises and companies from emerging markets, as the selected companies in this study are all listed companies and more than 80% of them are in OECD countries. Third, future studies can utilize additional qualitative variables to improve the understanding of how reputational threat affects

ESG disclosure strategies. Examples include news on stakeholder activism and executive interviews on controversial incidents.

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Tables:

Table 1. Descriptive statistics and correlation analysis

This table presents the descriptive statistics of the variables used in this paper, as well as the correlations between the variables. Definitions of the variables are presented in Appendix Table S1. Panel A presents the statistics of all the variables, and Panel B presents the correlation matrix among all the variables. All variables except Ext and Age are lagged by one year.

Panel A. Descriptive analysis ($N = 17{,}012$).

Variables	Mean	SD	Median	p25	p75
Ext	0.64	0.23	0.67	0.47	0.80
Int	0.41	0.24	0.42	0.21	0.58
$ESGCScore$	85.33	27.56	100	84.85	100
$In(MV)$	9.29	1.19	9.23	8.44	10.09
PPE	0.27	0.26	0.19	0.06	0.43
$Cash\ Flow/Sales$	18.83	15.33	15.66	9.04	26.29
$R\&D/Sales$	2.77	5.76	0	0	2.74
$Debt/Capital$	39.72	23.87	38.11	22.675	55.53
$CEOid$	0.85	0.36	1	1	1
$ChangeOrgStruc$	0.015	0.12	0	0	0
Age	63.99	58.50	47	18	99

Panel B. Correlation analysis, where *** refers to $p < 0.01$, ** refers to $p < 0.05$, and * refers to $p < 0.10$.

	Ext	Int	$ESGCScore$	$In(MV)$	PPE	$Cash\ Flow /Sales$	$R\&D/ Sales$	$Debt/ Capital$	$CEOid$	$Change OrgStruc$	Age
Ext	1.000										
Int	0.749***	1.000									
$ESGCScore$	-0.209***	-0.257***	1.000								
$In(MV)$	0.417***	0.421***	-0.395***	1.000							
PPE	0.031***	-0.008	0.033***	-0.076***	1.000						
$Cash\ Flow/Sales$	0.044***	-0.040***	0.053***	0.155***	0.216***	1.000					
$R\&D/Sales$	0.030***	0.038***	-0.028***	0.070***	-0.199***	-0.015**	1.000				
$Debt/Capital$	0.132***	0.120***	-0.126***	0.150***	0.070***	-0.014*	-0.226***	1.000			
$CEOid$	-0.068***	-0.083***	-0.026***	0.081***	0.060***	0.052***	0.033***	-0.002	1.000		
$ChangeOrgStruc$	0.004	0.001	0.012	-0.015*	-0.015**	-0.007	-0.012	0.009	-0.121***	1.000	
Age	0.090***	0.162***	-0.067***	0.101***	-0.118***	-0.157***	-0.066***	0.065***	-0.098***	0.011	1.000

Table 2. External and internal sustainability actions: Testing the nonlinear relationship by grouping companies into deciles based on the scores for internal sustainability actions

This table presents how the external actions of companies are determined by the level of internal sustainability actions. The standard errors, which are clustered at company level, are reported in parentheses. ***, **, and * indicate significance at levels of 0.01, 0.05, and 0.10, respectively.

Column	(1)	(2)	(3)	(4)	(5)	(6)
$Int\ Decile\_2_{t-1}$	0.0902***	0.0518***	0.0229***	0.0233***	0.0234***	0.0202***
	(0.00870)	(0.00672)	(0.00388)	(0.00386)	(0.00390)	(0.00450)
$Int\ Decile\_3_{t-1}$	0.199***	0.133***	0.0417***	0.0459***	0.0428***	0.0470***
	(0.00913)	(0.00742)	(0.00388)	(0.00392)	(0.00390)	(0.00477)
$Int\ Decile\_4_{t-1}$	0.272***	0.176***	0.0383***	0.0464***	0.0398***	0.0470***
	(0.0102)	(0.00825)	(0.00409)	(0.00421)	(0.00412)	(0.00525)
$Int\ Decile\_5_{t-1}$	0.325***	0.211***	0.0400***	0.0507***	0.0414***	0.0509***
	(0.0102)	(0.00864)	(0.00413)	(0.00423)	(0.00417)	(0.00551)
$Int\ Decile\_6_{t-1}$	0.365***	0.227***	0.0408***	0.0529***	0.0424***	0.0477***
	(0.0106)	(0.00901)	(0.00419)	(0.00434)	(0.00422)	(0.00584)
$Int\ Decile\_7_{t-1}$	0.386***	0.238***	0.0411***	0.0545***	0.0426***	0.0461***
	(0.0111)	(0.00972)	(0.00429)	(0.00452)	(0.00432)	(0.00623)
$Int\ Decile\_8_{t-1}$	0.400***	0.245***	0.0376***	0.0512***	0.0392***	0.0400***
	(0.0114)	(0.0102)	(0.00451)	(0.00479)	(0.00454)	(0.00676)
$Int\ Decile\_9_{t-1}$	0.421***	0.251***	0.0394***	0.0530***	0.0407***	0.0371***
	(0.0117)	(0.0110)	(0.00453)	(0.00486)	(0.00456)	(0.00715)
$Int\ Decile\_10_{t-1}$	0.434***	0.253***	0.0293***	0.0425***	0.0309***	0.0229***
	(0.0118)	(0.0113)	(0.00486)	(0.00523)	(0.00492)	(0.00794)
$ln(MV)_{t-1}$	0.0271***	0.0259***	0.00715***	0.00873***	0.00758***	0.0158***
	(0.00230)	(0.00311)	(0.000659)	(0.000759)	(0.000675)	(0.00186)
PPE_{t-1}	0.0403***	-0.0363	0.00847***	0.0170***	0.00832***	-0.00186
	(0.00968)	(0.0233)	(0.00241)	(0.00256)	(0.00246)	(0.0154)
$Cash\ Flow/Sales_{t-1}$	0.000204	-9.14e-05	-5.03e-05	-0.000214***	-4.01e-05	1.05e-05
	(0.000136)	(0.000118)	(3.74e-05)	(4.21e-05)	(3.80e-05)	(7.66e-05)
$R\&D/Sales_{t-1}$	0.000723*	0.00151	0.000446***	0.000659***	0.000428***	0.00105
	(0.000413)	(0.00104)	(9.75e-05)	(0.000113)	(9.92e-05)	(0.000648)
$Debt/Capital_{t-1}$	0.000330***	4.47e-05	7.07e-05***	3.97e-05	7.36e-05***	2.03e-05
	(0.000102)	(0.000115)	(2.59e-05)	(2.71e-05)	(2.66e-05)	(6.59e-05)
$CEOid_{t-1}$	-0.0203***	0.00739	-0.00670***	0.00222	-0.00712***	0.00557
	(0.00569)	(0.00738)	(0.00160)	(0.00317)	(0.00164)	(0.00496)
$ChangeOrgStruc_{t-1}$	-0.0144*	-0.00873	-0.00196	-0.00302	-0.00182	-0.00508
	(0.00863)	(0.00622)	(0.00474)	(0.00471)	(0.00475)	(0.00467)
Age_t	-6.04e-05		-2.73e-06	1.50e-05	-1.91e-06	
	(5.07e-05)		(1.07e-05)	(1.18e-05)	(1.13e-05)	
Ext_{t-1}			0.842***	0.792***	0.836***	0.610***
			(0.00584)	(0.00633)	(0.00593)	(0.00972)
$Constant$	-0.0135	0.354***	-0.0125	-0.0209**	-0.0818**	0.136***
	(0.0214)	(0.0351)	(0.00818)	(0.00996)	(0.0332)	(0.0205)
Observations	17,012	17,012	17,012	17,012	17,012	17,012
R^2	0.683	0.865	0.890	0.890	0.890	0.909
Company FE		Yes				Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE				Yes		
Industry FE					Yes	

Table 3. External and internal sustainability actions: Testing the nonlinear relationship with a quadratic term

This table presents the nonlinear relationship between the external and internal sustainability actions of companies with quadratic regression. The turning points where the relationship between Int and Ext changes are shown. The standard errors, which are clustered at the company level, are reported in parentheses. ***, **, and * indicate significance at levels of 0.01, 0.05, and 0.10, respectively.

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Int_{t-1}	1.160***	1.117***	1.158***	1.118***	0.813***	0.257***	1.117***	1.160***	0.813***	0.257***
	(0.0338)	(0.0276)	(0.0334)	(0.0271)	(0.0298)	(0.0187)	(0.0276)	(0.0332)	(0.0298)	(0.0187)
Int_{t-1}^2	-0.729***	-0.696***	-0.731***	-0.701***	-0.562***	-0.288***	-0.696***	-0.738***	-0.562***	-0.288***
	(0.0340)	(0.0279)	(0.0338)	(0.0277)	(0.0292)	(0.0181)	(0.0278)	(0.0336)	(0.0292)	(0.0181)
$ESGCScore_{t-1}$							-0.000264***	-0.000262***	3.00e-05	3.40e-05
							(5.68e-05)	(5.66e-05)	(4.08e-05)	(2.82e-05)
$ln(MV)_{t-1}$	0.0259***	0.0224***	0.0269***	0.0229***	0.0244***	0.0153***	0.0224***	0.0247***	0.0243***	0.0152***
	(0.00227)	(0.00203)	(0.00228)	(0.00205)	(0.00308)	(0.00187)	(0.00206)	(0.00235)	(0.00308)	(0.00187)
PPE_{t-1}	0.0408***	0.0649***	0.0365***	0.0589***	-0.0369	-0.000656	0.0649***	0.0363***	-0.0368	-0.000592
	(0.00955)	(0.00791)	(0.00966)	(0.00792)	(0.0231)	(0.0155)	(0.00791)	(0.00962)	(0.0231)	(0.0155)
$Cash\ Flow/Sales_{t-1}$	0.000252*	-0.000572***	0.000312**	-0.000517***	-8.90e-05	1.67e-05	-0.000572***	0.000357***	-9.04e-05	1.51e-05
	(0.000134)	(0.000123)	(0.000135)	(0.000124)	(0.000118)	(7.74e-05)	(0.000123)	(0.000135)	(0.000118)	(7.73e-05)
$R\&D/Sales_{t-1}$	0.000675*	0.00126***	0.000616	0.00119***	0.00144	0.00109*	0.00126***	0.000605	0.00145	0.00110*
	(0.000406)	(0.000338)	(0.000400)	(0.000339)	(0.00104)	(0.000655)	(0.000338)	(0.000399)	(0.00104)	(0.000656)
$Debt/Capital_{t-1}$	0.000328***	0.000116	0.000340***	0.000127	5.15e-05	2.52e-05	0.000116	0.000320***	5.15e-05	2.53e-05
	(0.000100)	(8.06e-05)	(9.94e-05)	(7.99e-05)	(0.000115)	(6.59e-05)	(8.09e-05)	(9.93e-05)	(0.000115)	(6.60e-05)
$CSRAudit_{t-1}$	-0.0205***	0.00188	-0.0224***	0.00110	0.00616	0.00543	0.00188	-0.0225***	0.00614	0.00541
	(0.00562)	(0.00738)	(0.00563)	(0.00731)	(0.00729)	(0.00494)	(0.00739)	(0.00561)	(0.00729)	(0.00495)
$ChangeOrgStruc_{t-1}$	-0.0115	-0.00219	-0.0105	-0.00171	-0.00652	-0.00395	-0.00218	-0.0106	-0.00648	-0.00391
	(0.00852)	(0.00772)	(0.00826)	(0.00738)	(0.00626)	(0.00472)	(0.00772)	(0.00824)	(0.00626)	(0.00472)
Age_t	-7.37e-05	2.23e-05	-7.60e-05	1.54e-05			2.23e-05	-7.48e-05	0.00730***	
	(5.00e-05)	(4.21e-05)	(5.06e-05)	(4.20e-05)			(4.21e-05)	(5.05e-05)	(0.00283)	
Ext_{t-1}						0.612***				0.612***
						(0.00962)				(0.00962)
$Constant$	-0.0255	0.0384*	-0.263***	-0.133***	0.334***	0.130***	0.0380	-0.217***	-0.201	0.127***
	(0.0208)	(0.0232)	(0.0780)	(0.0425)	(0.0347)	(0.0203)	(0.0250)	(0.0782)	(0.201)	(0.0202)
Turning Point	0.80	0.80	0.79	0.80	0.72	0.45	0.79	0.78	0.72	0.45
Observations	17,012	17,012	17,012	17,012	17,012	17,012	17,012	17,012	17,012	17,012
R^2	0.690	0.760	0.700	0.766	0.865	0.908	0.760	0.700	0.865	0.908
Company FE					Yes	Yes			Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE		Yes		Yes			Yes			
Industry FE			Yes	Yes				Yes		

Table 4. External and internal sustainability actions: Testing the differences in the quadratic relationship between subsamples based on companies' environmental reputation

This table presents how the quadratic relationships between the external and internal sustainability actions of companies differ between two subsamples: $ESGCScore = 100$ and $ESGCScore < 100$, as shown in Panels A and B, respectively. The turning points where the relationship between Int and Ext changes are shown. The standard errors, which are clustered at the company level, are reported in parentheses. ***, **, and * indicate significance at levels of 0.01, 0.05, and 0.10, respectively.

Panel A. Regressions with subsample where $ESGCScore = 100$

Column	(1)	(2)	(3)	(4)	(5)	(6)
Int_{t-1}	1.184***	1.127***	1.181***	1.124***	0.787***	0.236***
	(0.0402)	(0.0322)	(0.0393)	(0.0316)	(0.0372)	(0.0244)
Int_{t-1}^2	-0.756***	-0.707***	-0.759***	-0.709***	-0.550***	-0.286***
	(0.0430)	(0.0352)	(0.0419)	(0.0345)	(0.0395)	(0.0268)
$ln(MV)_{t-1}$	0.0206***	0.0229***	0.0221***	0.0242***	0.0232***	0.0143***
	(0.00300)	(0.00252)	(0.00298)	(0.00251)	(0.00392)	(0.00246)
PPE_{t-1}	0.0349***	0.0726***	0.0291***	0.0653***	-0.0523*	-0.00861
	(0.0112)	(0.00877)	(0.0111)	(0.00865)	(0.0270)	(0.0191)
$Cash\ Flow /Sales_{t-1}$	0.000440***	-0.000658***	0.000528***	-0.000579***	-7.06e-05	5.01e-05
	(0.000158)	(0.000137)	(0.000157)	(0.000137)	(0.000154)	(0.000110)
$R\&D/Sales_{t-1}$	0.000786	0.00138***	0.000761	0.00135***	0.00309**	0.00225**
	(0.000487)	(0.000397)	(0.000478)	(0.000397)	(0.00141)	(0.000910)
$Debt/Capital_{t-1}$	0.000369***	8.12e-05	0.000387***	9.50e-05	0.000169	0.000159*
	(0.000120)	(9.54e-05)	(0.000119)	(9.36e-05)	(0.000147)	(8.93e-05)
$CEOid_{t-1}$	-0.0236***	-0.00201	-0.0240***	-0.00206	0.00659	0.00356
	(0.00634)	(0.00865)	(0.00639)	(0.00838)	(0.00893)	(0.00618)
$ChangeOrgStruc_{t-1}$	-0.00508	0.00392	-0.00530	0.00292	-0.00596	-1.95e-05
	(0.00988)	(0.00901)	(0.00941)	(0.00855)	(0.00722)	(0.00575)
Age_t	-5.72e-05	5.44e-05	-5.27e-05	4.78e-05		
	(5.98e-05)	(4.63e-05)	(6.08e-05)	(4.69e-05)		
Ext_{t-1}						0.615***
						(0.0116)
$Constant$	0.0268	0.0272	-0.210***	-0.146***	0.349***	0.142***
	(0.0264)	(0.0287)	(0.0725)	(0.0451)	(0.0427)	(0.0263)
Turning Point	0.78	0.80	0.78	0.79	0.72	0.41
Observations	11,637	11,637	11,637	11,637	11,637	11,637
R^2	0.677	0.756	0.689	0.763	0.868	0.909
Company FE					Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE		Yes		Yes		
Industry FE			Yes	Yes		

Panel B. Regressions with subsample where $ESGCScore < 100$

Column	(1)	(2)	(3)	(4)	(5)	(6)
Int_{t-1}	0.993***	0.999***	0.973***	0.983***	0.722***	0.252***
	(0.0495)	(0.0476)	(0.0489)	(0.0453)	(0.0513)	(0.0381)
Int_{t-1}^2	-0.585***	-0.585***	-0.564***	-0.571***	-0.457***	-0.235***
	(0.0458)	(0.0417)	(0.0461)	(0.0409)	(0.0433)	(0.0325)
$ln(MV)_{t-1}$	0.0247***	0.0224***	0.0246***	0.0223***	0.0216***	0.0129***
	(0.00294)	(0.00282)	(0.00294)	(0.00273)	(0.00482)	(0.00328)
PPE_{t-1}	0.0517***	0.0526***	0.0535***	0.0533***	0.0298	0.0303
	(0.0123)	(0.0120)	(0.0125)	(0.0123)	(0.0382)	(0.0252)
$Cash\ Flow /Sales_{t-1}$	-1.81e-05	-0.000374**	6.07e-05	-0.000306*	-0.000113	-8.87e-05
	(0.000183)	(0.000185)	(0.000183)	(0.000184)	(0.000160)	(0.000116)
$R\&D/Sales_{t-1}$	0.000257	0.000925**	0.000167	0.000895**	-0.00104	-0.000903
	(0.000490)	(0.000449)	(0.000481)	(0.000435)	(0.00120)	(0.000921)
$Debt/Capital_{t-1}$	0.000242**	0.000195*	0.000275**	0.000222**	5.36e-05	-7.79e-05
	(0.000119)	(0.000108)	(0.000117)	(0.000105)	(0.000159)	(0.000100)
$CEOid_{t-1}$	-0.0108	0.00723	-0.0156*	0.00565	0.00515	0.00685
	(0.00819)	(0.00994)	(0.00809)	(0.00999)	(0.0108)	(0.00949)
$ChangeOrgStruc_{t-1}$	-0.0347**	-0.0186	-0.0297*	-0.0148	0.00161	-0.00241
	(0.0173)	(0.0150)	(0.0173)	(0.0147)	(0.0157)	(0.0112)
Age_t	-8.77e-05	-4.12e-05	-0.000111*	-5.61e-05		
	(5.58e-05)	(5.36e-05)	(5.71e-05)	(5.38e-05)		
Ext_{t-1}						0.560***
						(0.0198)
$Constant$	0.0383	0.0987***	0.165***	0.216***	0.376***	0.188***
	(0.0289)	(0.0322)	(0.0322)	(0.0379)	(0.0574)	(0.0387)
Turning Point	0.85	0.85	0.86	0.86	0.79	0.54
Observations	5,375	5,375	5,375	5,375	5,375	5,375
R^2	0.681	0.727	0.697	0.741	0.868	0.907
Company FE					Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE		Yes		Yes		
Industry FE			Yes	Yes		

Table 5. External and internal sustainability actions: Testing the mediating effect of companies' environmental reputation

This table presents the mediating effect of companies' environmental reputation on the relationship between external and internal sustainability actions. ESG controversies scores are used to measure companies' environmental reputation. Both the turning points when $dESGCScore$ equals 1 and 0 are presented here. The standard errors, which are clustered at the company level, are reported in parentheses. ***, **, and * indicate significance at levels of 0.01, 0.05, and 0.10, respectively.

Column	(1)	(2)	(3)	(4)	(5)	(6)
Int_{t-1}	1.013***	0.986***	1.004***	0.983***	0.732***	0.236***
	(0.0477)	(0.0461)	(0.0489)	(0.0456)	(0.0404)	(0.0285)
Int_{t-1}^2	-0.608***	-0.583***	-0.602***	-0.582***	-0.499***	-0.266***
	(0.0462)	(0.0430)	(0.0478)	(0.0433)	(0.0387)	(0.0269)
$dESGCScore_{t-1}$	-0.0621***	-0.0390***	-0.0617***	-0.0383***	-0.0243***	-0.00338
	(0.0111)	(0.0106)	(0.0113)	(0.0104)	(0.00894)	(0.00683)
$Int_{t-1} \times dESGCScore_{t-1}$	0.176***	0.159***	0.185***	0.164***	0.0976**	0.0300
	(0.0501)	(0.0457)	(0.0512)	(0.0458)	(0.0399)	(0.0298)
$Int_{t-1}^2 \times dESGCScore_{t-1}$	-0.151***	-0.137***	-0.161***	-0.144***	-0.0713	-0.0316
	(0.0546)	(0.0484)	(0.0555)	(0.0488)	(0.0435)	(0.0331)
$ln(MV)_{t-1}$	0.0227***	0.0223***	0.0240***	0.0231***	0.0242***	0.0152***
	(0.00235)	(0.00206)	(0.00235)	(0.00207)	(0.00307)	(0.00187)
PPE_{t-1}	0.0407***	0.0649***	0.0366***	0.0590***	-0.0354	-0.000570
	(0.00949)	(0.00790)	(0.00960)	(0.00790)	(0.0231)	(0.0154)
$Cash\ Flow/Sales_{t-1}$	0.000315**	-0.000561***	0.000366***	-0.000512***	-9.39e-05	1.47e-05
	(0.000134)	(0.000124)	(0.000135)	(0.000124)	(0.000118)	(7.73e-05)
$R\&D/Sales_{t-1}$	0.000639	0.00125***	0.000579	0.00118***	0.00142	0.00109*
	(0.000406)	(0.000339)	(0.000400)	(0.000339)	(0.00104)	(0.000657)
$Debt/Capital_{t-1}$	0.000309***	0.000120	0.000323***	0.000133*	6.52e-05	2.75e-05
	(9.96e-05)	(8.05e-05)	(9.88e-05)	(7.98e-05)	(0.000115)	(6.60e-05)
$CEOid_{t-1}$	-0.0206***	0.00162	-0.0224***	0.000807	0.00591	0.00544
	(0.00557)	(0.00738)	(0.00558)	(0.00731)	(0.00725)	(0.00494)
$ChangeOrgStruc_{t-1}$	-0.0127	-0.00274	-0.0118	-0.00220	-0.00673	-0.00393
	(0.00842)	(0.00769)	(0.00818)	(0.00736)	(0.00623)	(0.00474)
Age_t	-7.19e-05	2.21e-05	-7.41e-05	1.54e-05		
	(4.99e-05)	(4.19e-05)	(5.04e-05)	(4.18e-05)		
Ext_t-1						0.612***
						(0.00958)
$Constant$	0.0511**	0.0702***	-0.185**	-0.105**	0.355***	0.133***
	(0.0232)	(0.0250)	(0.0778)	(0.0434)	(0.0355)	(0.0210)
Turning Point when $dESGCScore = 0$	0.83	0.85	0.83	0.84	0.73	0.44
Turning Point when $dESGCScore = 1$	0.78	0.80	0.78	0.79	0.73	0.44
Observations	17,012	17,012	17,012	17,012	17,012	17,012
R^2	0.692	0.760	0.701	0.767	0.865	0.908
Company FE					Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE		Yes		Yes		
Industry FE			Yes	Yes		

Table 6. External and internal sustainability actions: Testing the robustness with mean centering of the scores for internal sustainability actions

This table serves as a robustness test for the quadratic relationship between the external and internal sustainability actions of a company by adopting mean-centered Int as the independent variable. The turning points where the relationship between Int and Ext changes are shown. The standard errors, which are clustered at the company level, are reported in parentheses. ***, **, and * indicate significance at levels of 0.01, 0.05, and 0.10, respectively.

Column	(1)	(2)	(3)	(4)	(5)	(6)
$(Int - \overline{Int})_{t-1}$	0.548***	0.530***	0.543***	0.527***	0.344***	-0.0253**
	(0.0129)	(0.0113)	(0.0129)	(0.0112)	(0.0142)	(0.0109)
$(Int - \overline{Int})^2_{t-1}$	-0.678***	-0.652***	-0.681***	-0.655***	-0.438***	-0.178***
	(0.0397)	(0.0326)	(0.0392)	(0.0322)	(0.0345)	(0.0224)
$ln(MV)_{t-1}$	0.0281***	0.0251***	0.0292***	0.0256***	0.0321***	0.0188***
	(0.00226)	(0.00204)	(0.00227)	(0.00205)	(0.00327)	(0.00194)
PPE_{t-1}	0.0450***	0.0692***	0.0408***	0.0633***	-0.0310	0.00370
	(0.00962)	(0.00798)	(0.00974)	(0.00798)	(0.0251)	(0.0161)
$Cash\ Flow/Sales_{t-1}$	0.000196	-0.000636***	0.000253*	-0.000581***	-0.000150	-4.79e-06
	(0.000135)	(0.000125)	(0.000136)	(0.000125)	(0.000125)	(7.95e-05)
$R\&D/Sales_{t-1}$	0.000753*	0.00138***	0.000712*	0.00133***	0.00140	0.00105
	(0.000410)	(0.000343)	(0.000406)	(0.000346)	(0.00108)	(0.000664)
$Debt/Capital_{t-1}$	0.000306***	9.52e-05	0.000314***	0.000103	3.11e-05	1.81e-05
	(0.000103)	(8.28e-05)	(0.000101)	(8.19e-05)	(0.000123)	(6.85e-05)
$CEOid_{t-1}$	-0.0218***	0.00212	-0.0239***	0.00118	0.00643	0.00548
	(0.00559)	(0.00736)	(0.00560)	(0.00731)	(0.00758)	(0.00499)
$ChangeOrgStruc_{t-1}$	-0.00741	0.00107	-0.00655	0.00152	-0.00503	-0.00317
	(0.00854)	(0.00786)	(0.00832)	(0.00751)	(0.00637)	(0.00476)
Age_t	-7.84e-05	1.71e-05	-8.19e-05	9.12e-06		
	(5.04e-05)	(4.16e-05)	(5.11e-05)	(4.16e-05)		
Ext_{t-1}						0.640***
						(0.00966)
$Constant$	0.110***	0.156***	-0.121	-0.0101	0.531***	0.122***
	(0.0213)	(0.0240)	(0.0814)	(0.0458)	(0.0358)	(0.0215)
Turning Point	0.80	0.80	0.79	0.79	0.79	0.32
Observations	17,012	17,012	17,012	17,012	17,012	17,012
R^2	0.681	0.752	0.690	0.758	0.856	0.905
Company FE					Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE		Yes		Yes		
Industry FE			Yes	Yes		

Table 7. External and internal sustainability actions: Testing the robustness with subsamples based on financial indicators

This table determines whether the turning points of external actions significantly differ for companies with above-median leverage ratio (or fixed assets) to those with below-median leverage ratio (or fixed assets). The differences in the turning point values are reported, and the standard errors of the difference levels, which are clustered at the company level, are reported in parentheses. The control variables selected here are the same as those in Table 2. ***, **, and * indicate significance at levels of 0.01, 0.05, and 0.10, respectively.

Fixed Effects Controlled	$Turning\ Point\ (Debt/Capital > median) - Turning\ Point\ (Debt/Capital \leq median)$	$Turning\ Point\ (PPE > median) - Turning\ Point\ (PPE \leq median)$
Year	0.0504**	-0.0653***
	(0.0201)	(0.0205)
Year, Industry	0.0457**	-0.0659**
	(0.0199)	(0.0207)
Year, Region	0.319*	-0.0462**
	(0.0194)	(0.0190)
Year, Region, Industry	0.0316*	-0.0450**
	(0.0192)	(0.0190)
Observations	17,012	17,012
Control Variables	Yes	Yes

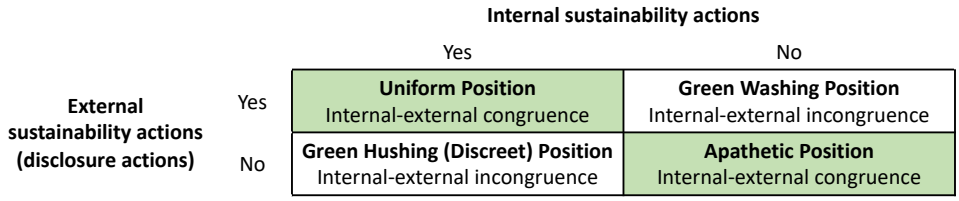

Fig. 1. Definition of greenhushing from the perspective of an internal–external congruence-based action position matrix (adapted from Aragón-Correa et al. (2016) and Ginder et al. (2021)).

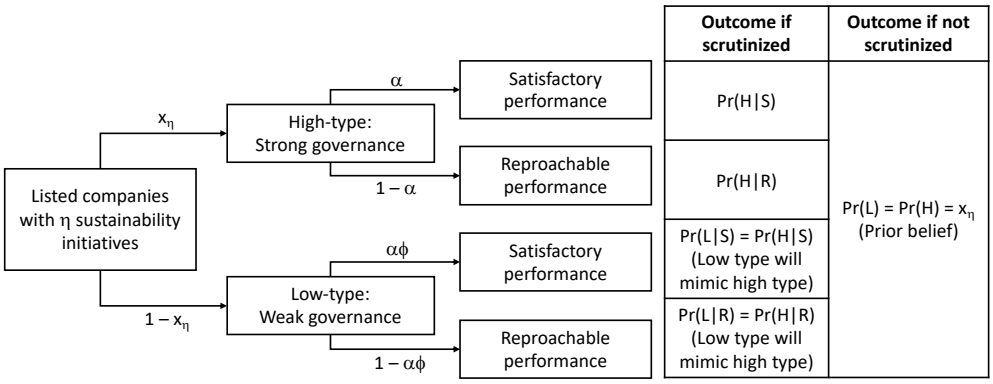

Fig. 2. Graphical summary of the setting of the theoretical framework for greenhushing. Among listed companies with η sustainability initiatives, they are classified as either high-type (strong governance) or low-type (weak governance) companies, with a fraction of x_η and $1 - x_\eta$, respectively. The figure outlines the decision making and outcomes when these companies do or do not face scrutiny. When companies are scrutinized, their sustainability performance is evaluated as satisfactory or reproachable, prompting stakeholders to update their beliefs. In contrast, when companies are not scrutinized, they rely on the prior belief. This framework assumes strategic imitation by low-type companies on high-type companies' external actions to maintain a pooling equilibrium.

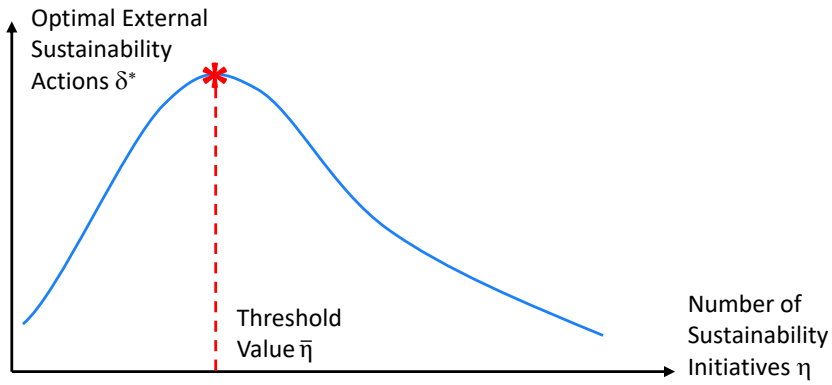

Fig. 3. Optimal external sustainability actions as a function of sustainability initiatives.

The level of optimal external sustainability actions peaks with a threshold number of sustainability initiatives, displayed as an inverted U-shaped relation.

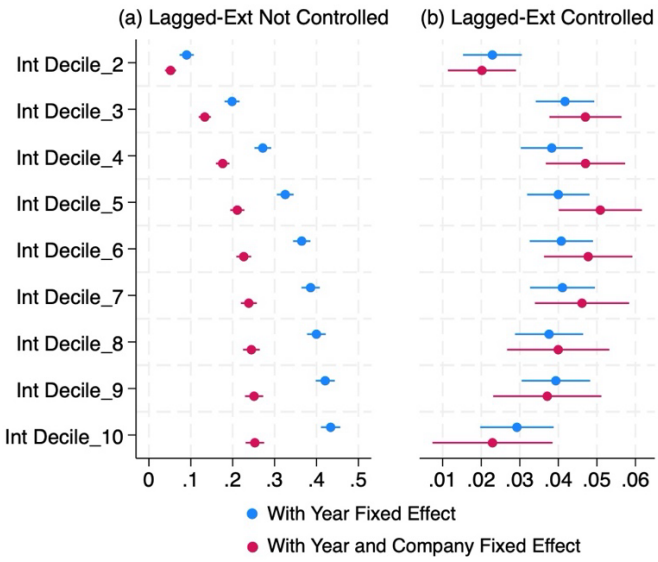

Fig. 4. Variations in the regression coefficients between external actions and different deciles of internal sustainability actions.

The figure is based on the results in Table 2. (a) depicts the results when the one-year lagged external actions are not controlled with year (in blue) or year and company fixed effects are controlled (in red). (b) depicts the results when we further control for the one-year lagged external actions. The 95% confidence intervals of the coefficients are plotted as error bars in the figure.

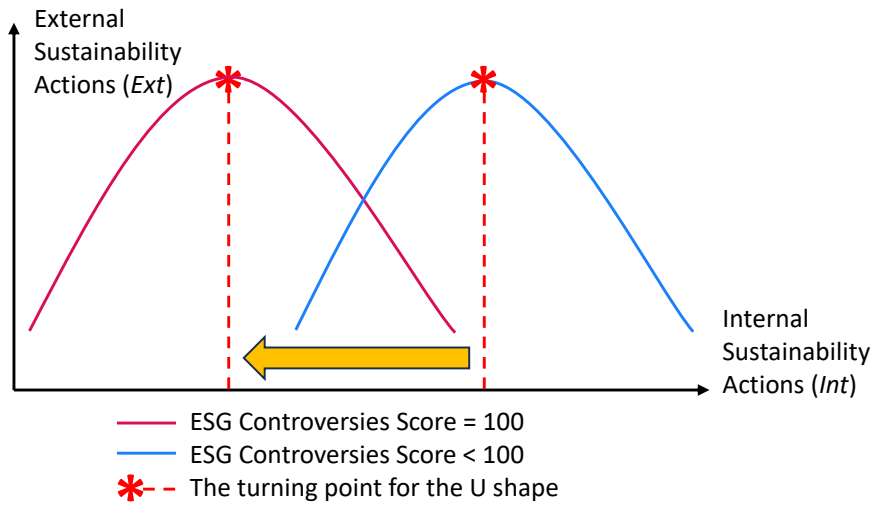

Fig. 5. Shift of turning point of the inverted U-shaped relationship between external and internal sustainability actions.

The figure is based on the results in Table 4. It indicates a significant decrease in the turning point value when the ESG controversies scores shift from below 100 (in blue) to 100 (in red).