




## RESEARCH ARTICLE

# Independent directors and environmental innovations: How the visibility of public and private shareholders' environmental activism moderates the influence of board independence

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## Abstract

While independent directors focus on preserving the shareholders' interests, their individual preferences may differ with regard to how environmental innovations have to be considered. A growing importance of shareholders' environmental activism has sought to influence firms' environmental practices through public proposals and private negotiations with executives. Using a sample of 7111 firms listed in the S&P 1500 index between 2006 and 2019, we examine how the visibility of shareholders' environmental proposals moderates the relationship between board independence and environmental innovations. Our findings show that public and private shareholder activism related to community issues and external reporting reinforces the positive influence of independent directors on firms' environmental innovations. However, private dialogues between executives and environmental activists focused on emissions from company operations diminish the influence of independent directors. Our study sheds light on how the external visibility of the topics involved in the activists' environmental proposals reinforces the interest of independent directors in advancing environmental innovations.

## KEYWORDS

board of directors, environmental innovations, independent directors, shareholders' environmental activism

## 1 | INTRODUCTION

The 2022 EY Corporate Governance Survey revealed that 84% of business leaders acknowledge increased expectations from society that companies will promote environmental sustainability. Nonetheless, 68% of the respondents recognize significant differences of opinion among leadership regarding sustainable investments (EY, 2022). In general, boards of directors serve as co-creators of companies' environmental strategies by approving and advising on environmental investment initiatives (Aguilera et al., 2021; Berrone & Gomez-Mejia, 2009; Kassinis & Vafeas, 2002). Previous

research has confirmed the relationship between independent directors and corporate environmental transparency (Gerged, 2021) as well as the prevention of environmental litigation (Kassinis & Vafeas, 2002). However, the uncertain nature of financial investments in environmental innovations makes unclear the role of the independent directors in related firms' environmental decisions (Aguilera et al., 2022). In the present context of exponential growth of shareholders' environmental activism, this paper contributes by analyzing how the influence of board independence on corporate environmental innovations is moderated by shareholders' environmental activism.

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Environmental innovations aim to reduce the negative impact of firms' operations on ecosystems, but their success relies on multiple legal, technical, and market factors (Berrone et al., 2013; Leyva-de la Hiz et al., 2019). The substantial long-term investments and the risky financial implications of environmental innovations have often made directors skeptical about such investments (Buyl et al., 2019). Our analysis is relevant because it sheds light on how independent directors, who in turn may have different preferences regarding environmental innovations, may be affected by the visibility of shareholders' environmental activism.

Previous literature has generally found a positive relationship between board independence and corporate socio-environmental progress (Amran et al., 2014; De Villiers et al., 2011; Galbreath, 2010; Garcia-Martín & Herrero, 2020; Gerged, 2021; Kassinis & Vafeas, 2002). However, we argue that the existence and nature of shareholders' environmental activism are essential in understanding the influence of independent directors when dealing with environmental innovations. It is important to highlight that independent directors will not only serve shareholders' interests (Arthurs et al., 2008) but also prioritize their own professional interests by avoiding corporate abuse, which could lead to their professional devaluation (Marcel & Cowen, 2014) and protecting the firms' reputation (Cowen & Marcel, 2011). Hence, independent directors usually pay extra attention to potential discontent with firms' strategies.

Shareholders' environmental activism is a way to publicly express the shareholder discontent with firms' environmental strategies in order to draw management attention and suggest new approaches (Eesley et al., 2016). One of the most popular forms of shareholders' environmental activism is to include environmental proposals in proxy materials to discuss at the firm's annual general meeting (Goranova et al., 2017; Reid & Toffel, 2009). While discussing and voting the shareholders' proposals at the annual meetings is considered a popular way of public activism, executives may negotiate with shareholders so that the activists withdraw the shareholder proposals before the proxy ballot is finalized, which entails a form of private activism (Goranova et al., 2017; Semenova & Hassel, 2019). We propose that the influence of independent directors on firms' environmental innovations can be reinforced when certain activist shareholders raise public concerns about dimensions connected to highly visible environmental topics with a potential reputational effect.

Our analysis draws on a sample of 7111 observations of firms listed in the Standard and Poor's (S&P) 1500 index, representing various industries over the period 2006–2019. Our results confirm that environmental activism connected with external reporting and community implications can reinforce the positive influence of independent directors on a firm's environmental innovations. In line with our expectations, our results also reveal that the impact of independent directors dilutes when executives and activist shareholders make private environmental agreements related to internal operations. Interestingly, and contrary to our initial expectations, our analysis demonstrates that private shareholders' environmental activism related to the visible topics of reporting and community can actually enhance the positive influence of independent directors on firms' environmental innovations.

This paper contributes by answering calls to expand the agency perspective of boards by linking their decisions with external interests beyond the traditional dichotomy of shareholders versus executives (Eccles et al., 2020; Flammer et al., 2021) while simultaneously considering the directors' reputational priorities (Cowen & Marcel, 2011; Li et al., 2018; Marcel & Cowen, 2014). Additionally, we extend the contingent view of board governance (Bonini et al., 2021; Desender et al., 2013; Li et al., 2018; Wang et al., 2019; Witt et al., 2021) by examining how the impact of the growing importance of shareholders' environmental activism influences governance decisions (Flammer et al., 2021; Goranova & Ryan, 2014; Reid & Toffel, 2009). Overall, our paper confirms the importance of boards in firms' sustainability strategies (Aguilera et al., 2022, 2021; Eccles et al., 2020), and we show that the influence of independent directors is moderated by the different visibility of activist shareholders' environmental interests.

## 2 | BOARD INDEPENDENCE AND ENVIRONMENTAL INNOVATIONS

Environmental innovations seek to improve the impact of business operations on people's daily lives and ecosystems, while maintaining financial viability (Berrone et al., 2013). However, it is often challenging to assess the expected returns of environmental innovation activities because they typically require significant long-term investments with uncertain results (Leyva-de la Hiz et al., 2019; Montiel & Delgado-Ceballos, 2014). Consequently, financial risks may lead to raising doubts about the directors' preferences regarding environmental innovations. We acknowledge that independent directors may have different preferences for environmental innovations in firms; however, previous literature has generally found a positive relationship between board independence and corporate environmental progress (Arthurs et al., 2008; Cowen & Marcel, 2011; Li et al., 2018). The positive link has been connected to several factors.

First, independent directors may be more capable to meet the specific monitoring and advising competences required to improve firms' environmental innovation due to their own background (Balsmeier et al., 2014). The agency theory (Fama & Jensen, 1983; Jensen & Meckling, 1976) highlights the importance of board independence in protecting shareholders from executives' opportunistic behavior. Independent directors, in general, are more vigilant because they lack strategic and emotional connections to the firms' daily operations (Hillman & Dalziel, 2003). As a result, they bring greater objectivity to the table, questioning and analyzing performance and executives' decisions (De Villiers et al., 2011; Ellstrand et al., 2002).

Second, independent directors' careers do not only rely on their arbitration capacity, but they also rely on maintaining, externally, their professional reputation (Li et al., 2018), which, in turn, is dependent on their firm's standing (De Villiers et al., 2011). It is important to highlight the fact that independent directors are also agents themselves, with their own personal interests and incentives, so it is not possible to assume that they will duly serve the interests of shareholders (Arthurs et al., 2008; Li et al., 2018). In fact, independent directors' incentives to preserve their own interests can affect their influence

on a firm's strategy. The reputation of independent directors is one of their most valuable assets (Li et al., 2018; Marcel & Cowen, 2014; Yermack, 2004) as it enables them to keep their positions and obtain new board seats in the future (Marcel & Cowen, 2014). Moreover, independent directors are more likely to lose their board seats when facing controversial situations, which may affect their ability to secure new board appointments (Arthaud-Day et al., 2006). The recognition of independent directors is primarily based more on tangible corporate outcomes resulting from their services, rather than their personal monitoring capacities (Arthurs et al., 2008). Therefore, independent directors are motivated to support firms' strategies that enhance their social image and prevent negative firm outcomes, resulting not only from poor financial performance but also from corporate abuse that can subsequently damage their reputations and cause professional devaluation (Marcel & Cowen, 2014; Wowak et al., 2015). In other words, independent directors' professional interests may lead them to be more positive than internal directors about reinforcing corporate environmental outputs, as they may benefit from a potential improvement in corporate reputation (Gerged, 2021; Johnson & Greening, 1999).

Third, society's growing expectations regarding the role of independent directors may also influence their preferences toward environmental innovations. Dalton et al. (2007) argue that independent directors are expected to be more responsible for a firm's decisions related to the natural environment due to the moral need of accountability. In this context, independent directors may feel an extra-institutional pressure to support the environmental interests of shareholders while balancing the firm's financial performance as well as the external implications of its activities (Boh et al., 2020; Flammer et al., 2021).

Therefore, independent directors can become more effectively involved in developing environmental innovations than internal directors since they are less committed than executives to the inertias of traditional operations. Additionally, they feel increased external institutional pressure to protect moral interests and have greater incentives to maintain a good reputation and network with external agents to preserve their own professional interests. So, we propose the following hypothesis as the baseline for our study:

**H1.** Board independence positively influences the firms' subsequent environmental innovations.

### 3 | ENVIRONMENTAL ACTIVISM AND BOARD INDEPENDENCE

#### 3.1 | Delimitation of shareholders' environmental activism

Shareholders' environmental activism has grown exponentially due to shareholders' increasing concerns about the negative impacts of firms on society and their corporate implications (Financial Times, 2021). While shareholders' environmental activism was originally associated with certain socially oriented groups, such as labor union funds, social

activists, and religious groups (Lazard, 2021), the financial implications of corporate environmental decisions have motivated environmental activism to emerge from almost any type of investor (David et al., 2007; Flammer et al., 2021; Ryan & Schneider, 2002). Eccles and Klimenko (2019) account for discussions on Environmental, Social and Governance (ESG) topics in quarterly calls with investors and analysts for about half of the companies that belong to the S&P 1500 index. Specifically, shareholders' environmental activism aims to influence environmental corporate outcomes, such as a firm's environmental performance (Bernard et al., 2023; Goranova & Ryan, 2014; Lee & Lounsbury, 2011), disclosure of environmental strategies (Reid & Toffel, 2009), or enhancing firms' environmental policies (Clark & Crawford, 2012).

One of the most popular forms of shareholders' environmental activism is shareholder proposals, which allow shareholders to express their environmental concerns (Goranova et al., 2017; Reid & Toffel, 2009). Environmental shareholder proposals are a common way for shareholders to publicly express their critics to the executive team regarding environmental strategies in order to draw management attention (Eesley et al., 2016) and challenge the organizational status quo (Neubaum & Zahra, 2006). The proposals may attract negative public attention to both the firm and its executives (Hadani et al., 2011) as they express strong disagreement and criticism that can harm the firm's reputation (David et al., 2007). So, the submission of these environmental shareholder proposals as proxy materials for discussion at the firm's annual general meeting represents a signal that garners significant public attention. Moreover, these proposals originate from a highly credible source, corporate oversight, thereby carrying substantial weight for the firm's stakeholders (Goranova & Ryan, 2014). However, executives may choose to agree, settle, or negotiate with shareholders so that the shareholder proposals are withdrawn by the activists before the proxy ballot is finalized. This indicates that the targeted firm has engaged and is likely to be compromised with these activist shareholders (Ertimur et al., 2010; Proffitt Jr & Spicer, 2006). When shareholder proposals are withdrawn by the activists, this involves a form of private shareholder activism as the interaction between activist shareholders and executives in targeted firms is based on confidential dialogues and negotiations between both parties (Goranova et al., 2017; Semenova & Hassel, 2019). The withdrawal of shareholder proposals evidences the willingness of shareholders to engage in dialogues and their trust in the management team (Eesley et al., 2016; Goodman et al., 2014; Semenova & Hassel, 2019), while at the same time it also reflects executives' preference for reaching agreements with shareholders instead of engaging in public disputes (Goodman et al., 2014). Consequently, the withdrawal of proposals prior to voting restricts public discussion, enabling control over potential reputational damage to firms and executives (Chung & Talaulicar, 2010; Eesley et al., 2016; Goranova et al., 2017).

Building on a contingency perspective of corporate governance (Pearce & Zahra, 1992), we argue that both public and private shareholders' environmental activism may moderate the influence of independent directors on a firm's environmental innovations.

### 3.2 | The moderating role of public environmental activism

Shareholder proposals identify a firm's strategic issue for certain shareholders and, simultaneously, they represent a challenge to the way executives conduct firms' strategies (Hadani et al., 2011; Neubaum & Zahra, 2006). In spite of the growing number and importance of environmental shareholder proposals, paradoxically, the vast majority of these proposals are voted against in general meetings (Financial Times, 2021). As a way of illustration, Thomas and Cotter (2007) report that out of the 403 social and environmental shareholder proposals studied in their sample, none of them achieved approval. However, Reid and Toffel (2009) show that firms subject to environmental shareholder proposals are more likely to engage in the Carbon Disclosure Project, and this effect is even more pronounced in firms that operate in environmentally sensitive industries. Lee and Lounsbury (2011) also find that environmental shareholder proposals boost firms' environmental performance, which is exacerbated in larger firms as well as those that serve in industries closer to end-users.

Specifically, environmental shareholder proposals raise the perception of executives and board members about the legitimacy and power of environmentally sensitive actors and indirectly increase the effectiveness of congruent views on the board (Goranova & Ryan, 2014). This public shareholders' environmental activism involves a public contest to the legitimacy of corporate management and aims to gain support for alternative courses of action, rather than imposing changes directly through the attraction of the necessary voting requirements in annual meetings (Back & Colombo, 2021; David et al., 2007; Goranova & Ryan, 2014). In fact, public shareholder activism has more of a signaling function than a disciplining one (David et al., 2007). Shareholder proposals seek to pressure and gain strength through the knowledge or action of other third parties (Eesley et al., 2016). These external governance forces exert significant influence in shaping the actions of boards and executives (Aguilera et al., 2015). One of the consequences of the activist shareholders' decisions to fill environmental proposals is that executives and directors will have to pay extra attention to these environmental topics.

In this scenario, the reputational concerns of independent directors will increase in publicly challenging situations (De Villiers et al., 2011), which will encourage independent directors to carry out a more intensive monitoring of the environmental progresses so as to meet public demands. Additionally, when sensitive external issues are involved, independent directors' voices are reinforced as firms will adopt corporate governance practices aligned with the monitoring interests of independent directors (Witt et al., 2021). Specifically, under public shareholder activism, executives and inside directors may give more value to independent directors' views by accepting that independent advice is necessary to balance their managerial decisions with a long-term optimal approach for the firm (Boone et al., 2007). Therefore, shareholder proposals indirectly reinforce the roles of independent directors as qualified advisors and co-creators of firms' strategies. This consequence is consistent with the agency's

view regarding independent directors' monitoring capacity to safeguard a firm's long-term viability (Li et al., 2018).

Hence, while inside directors would be usually less likely to consider alternative approaches to face new challenges, such as environmental concerns (Carpenter & Westphal, 2001), they are more open to introducing environmental changes (Johnson et al., 1993; Westphal, 1998) in the context of a higher level of public shareholders' environmental activism. We propose that the signaling function of public shareholders' environmental activism and its potential reputational implications reinforce independent directors' monitoring interests and legitimization to push for a more ambitious environmental agenda. As such, our hypothesis is as follows:

**H2.** : Public shareholders' environmental activism positively moderates the relationship between board independence and firms' subsequent environmental innovations.

### 3.3 | The moderating role of private shareholders' environmental activism

Private shareholders' environmental activism is based on the existence of negotiations and dialogues between management and shareholder activists (Goranova et al., 2017; Reid & Toffel, 2009). In fact, executives may be more receptive to demands made by shareholders out of the public eye than to those made in public, so as to avoid public attention and the subsequent monitoring (David et al., 2007; Hadani et al., 2011). Furthermore, private shareholder activism provides extra flexibility for the involved agents to alter their approaches without generating extra commitments with other parties (Eesley et al., 2016; Goranova et al., 2017).

Although private activism may be difficult to discern externally due to its confidential nature, the analysis of agreements that result in proposals withdrawn prior to voting is one of the most popular ways of examining private shareholder activism (Clark & Crawford, 2012; Goranova et al., 2017; Kim et al., 2019). To illustrate, Clark and Crawford (2012) describe how firms often obtain the withdrawal of resolutions on the topic of climate change by being willing to achieve agreements with shareholders with regard to environmental policies and plans (and simultaneously retain their investments) even when these proposals had a low chance of being accepted in the meetings. By doing so, private negotiations avoid extra public disputes and formal voting, which may damage the reputation of both firms and their leaders (Bauer et al., 2015; Clark & Crawford, 2012; David et al., 2007; Logsdon & Van Buren, 2009; Semenova & Hassel, 2019; Wassmer et al., 2014).

Private agreements provide additional opportunities for effective implementation of alternative strategies; however, they also reduce the capacity of third parties to monitor or influence the new course of action. Although private forms of shareholders' environmental activism may come through a range of multiple alternatives, a discrete dialogue is necessarily a central element of any private approach

(Busch & Hoffmann, 2009; Eesley et al., 2016; Logsdon & Van Buren, 2009). In this situation, the monitoring role of independent directors as qualified advisors may become less relevant. One of the independent directors' main duties is to reduce potential conflicts between management, shareholders, and other stakeholders (Gerged, 2021); however, their influence on corporate decisions is weakened when executives and activists can independently identify an alignment of their interests. Furthermore, private activism does not signal firms' issues as publicly, which means that the reputation of firms and independent directors is less at stake (Li et al., 2018). Consequently, independent directors' concerns about their own interests in the resulting consequences of private agreements will decrease.

Hence, the confidentiality and direct dialogue of conversations between executives and environmental activists reduce the importance of independent directors' role in introducing environmental innovation, as their external pressure and personal incentives are weakened. As a result, our hypothesis is as follows:

**H3.** : Private shareholders' environmental activism negatively moderates the relationship between board independence and firms' subsequent environmental innovations.

## 4 | METHODOLOGY

### 4.1 | Sample and variables

Our hypothesis was tested using a panel dataset of S&P 1500 firms from 2006 to 2019. Starting from this initial sample, we triggered data on board independence from the Refinitiv Eikon database. We also captured firm characteristics such as size, financial situation, and industry from the same database. Furthermore, we gathered data on shareholder proposals from the Institutional Shareholder Services (ISS) database, which provides information on shareholder activism for the companies in our panel. Due to missing data for some firms, we dropped part of the initial firm-year observations. The final sample of this process includes 7111 firm-year observations from 1249 firms. More details regarding the different industries are available in Table 1.

**TABLE 1** Industry distribution.

Industry	Freq.	Percent	Cum.
Consumer	1504	21.15	21.30
Energy	364	5.12	26.27
Financials	385	5.41	31.68
Health care	867	12.19	43.88
ICT	1288	18.11	61.99
Industrials	1244	17.49	79.48
Materials	523	7.35	86.84
Real estate	581	8.17	95.01
Utilities	355	4.99	100.00
Total	7111	100.00	

### 4.1.1 | Dependent variable: Environmental innovations

We measure firms' environmental innovations through the Environmental Innovation Score available at Refinitiv Eikon. This variable measures the commitment and capacity of firms to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies, processes, or eco-designed products. To calculate this score, Eikon captures green revenues, research and development, and capital expenditures connected to environmental developments, assigning a final score based on the firms' situation with respect to the rest of the companies in the same industry (Refinitiv, 2021). This measure provides an individual environmental innovation score for each firm, providing results that are comparable across industries and countries (Berrone et al., 2013).

### 4.1.2 | Independent variable: Board independence

There are several sources and standards of governing director independence (Elberg et al., 2022). We define board independence as the percentage of strictly independent board members out of the total number of members on the board. Specifically, we follow the regular stock exchange listing requirements of independence, and we count board members that meet with the following criteria: They are not employed by the firm, they have not served on the board for more than 10 years, they are not a reference shareholder with more than 5% of holdings, they do not hold a cross-board membership, they have no recent, immediate family ties to the firm, and they are not accepting any compensation other than compensation for board service. This value is audited by the Refinitiv Eikon database rather than simply reported by the companies, ensuring the accuracy of the information.

### 4.1.3 | Moderating variable: Shareholders' environmental activism

As with previous research (e.g., Acharya et al., 2022; Flammer, 2015), we analyze shareholders' environmental activism through shareholder proposals on environmental topics. We use the ISS database that collects detailed information for each proposal filled. In our study, we classified the proposals into four categories related to environmental initiatives: "emissions proposals" (26.4% of the analyzed proposals) for proposals on toxic and GHG emissions; "energy proposals" (21.2%) for proposals on nuclear power, hydraulic fracturing, wood procurement, energy efficiency, and renewable energy; "community proposals" (27.6%) for operations in protected areas, climate change action, recycling, and community impact proposals; and "reporting proposals" (24.8%) for reports on environmental policies or climate change. While proposals related to community and reporting focus on highly visible initiatives with societal impact, those related to

emissions and energy are more connected to internal operations with limited visibility (Hawn & Ioannou, 2016).

We specifically measure public shareholders' environmental activism through the number of environmental shareholder proposals filled for every firm-year for each of the four categories previously described: emissions, energy, community, and reporting. Following previous research (e.g., Clark & Crawford, 2012; David et al., 2007), we use the number of withdrawn environmental shareholder proposals by firm-year as a proxy of private shareholders' environmental activism for each of the four categories of proposals. In our sample, 37% of all proposals were withdrawn by the shareholders prior to voting.

#### 4.1.4 | Control variables

We added multiple control variables to capture how alternative variables might influence firms' environmental innovations, with data from Refinitiv Eikon. Specifically, we controlled for the financial situation of the firm by using the return on equity (ROE), firm size measured as the logarithm of the total number of employees (Employees), as well as the firm's revenue captured by the logarithm of the total turnover (Revenue). We also used a proxy of good governance mechanisms (Shareholder rights) to capture shareholder relevance and the commitment to egalitarian rights (Benton, 2017; Bushee, 2001). To construct this variable, we considered the existence or absence of policies that ensure equal treatment of minority shareholders, equal voting rights to apply the one-share one-vote principle, and policies to promote shareholder engagement. We created a continuous variable that was 0 when none of these policies are present and 1 when they were all present.

Finally, we also included an industry variable (Industry) to capture any potential discrepancies between industries, as well as year fixed effects. Through these control variables, we aim to eliminate any endogeneity concerns that may arise among the firms during the period studied.

## 4.2 | Methods

We gathered a longitudinal dataset of S&P 1500 firms, enabling us to utilize its panel structure in our analysis. The Breusch–Pagan Lagrangian multiplier test allowed us to confirm ( $p < .001$ ) that a panel regression was a better approach than the ordinary least squares (Breusch & Pagan, 1979). To analyze whether to use random effects or fixed effects (FE), we performed the Hausman test. The Hausman test value ( $p < .001$ ) allowed us to use the FE methodology. In any case, we double checked the direction of our results by using random instead of fixed effects. Then, we tested for the presence of autocorrelation and heteroskedasticity in our analysis (Kim & Youm, 2017). Autocorrelation was present in every firm ( $p < .001$  for the Wooldridge test for autocorrelation) and so was heteroskedasticity ( $p < .001$  based on the Modified Wald test for groupwise heteroskedasticity). As a

consequence, and similar to previous governance research (e.g., Desender et al., 2016), we estimated Huber–White robust standard errors, clustered at firm level, to control the lack of independence among observations and limit the potential influence of heteroskedasticity (Baltagi & Wu, 1999). Finally, we performed a FE regression analysis with the appropriate robust standard errors by firm to account for within-firm error correlations and year FE to capture any time trend that could potentially affect our study. Additionally, we estimated a variant of our models by including industry-by-year fixed effects to account for any industry-specific trends (Flammer et al., 2021). We operationalized our analysis with Stata 16, using the `xreg` command with fixed effects (`fe`) and robust standard errors clustered at the firm level (`vce [robust]`).

## 5 | RESULTS

Table 2 presents means, standard deviations, and pairwise correlations of all the variables in our models. Table 3 displays the estimates from a series of models that examine the relationship between board independence, shareholders' environmental activism, and firms' environmental innovations. Specifically, Model 1 shows control variables results. In our study, we find a significant positive effect of good governance practices on environmental innovations through firms' treatment of shareholders. This suggests that companies that prioritize the interests of their shareholders are more likely to be advanced in terms of environmental innovations, indicating a link between more egalitarian shareholder rights and firms' environmental innovations.

In model 2, we found a nonsignificant relationship regarding a direct effect of board independence on a firm's environmental innovations for the sampled firms, when accounting for firm-year effects. Similarly, in model 3, when we included industry-year fixed effects, we obtained comparable results. Therefore, it remains unclear whether or not boards with a higher percentage of independent directors would enhance a firms' environmental proactivity.

Table 4 displays models 4A–D and 5A–D, which were used to test H2 for each of the proposal categories previously described: emissions, energy, community, and reporting. Model 4C provides empirical support for a significant interaction effect of “community proposals” when considering firm-year fixed effects ( $\beta = 0.218$ ;  $p < 0.01$ ) as well as firm and industry-year fixed effects in model 5C ( $\beta = 0.211$ ;  $p < 0.01$ ). Furthermore, the interaction effect for “reporting proposals” is also significant and positive when accounting for firm and year fixed effects ( $\beta = 0.218$ ;  $p < 0.10$ ), as shown in model 4D. Then, in Table 5, models 6A–D and 7A–D were used to test H3, which predicts the moderating effect of private shareholders' environmental activism on the relationship between board independence and environmental innovations. In this instance, model 6A provides empirical support for a significant interaction effect for “emissions proposals” when accounting for firm-year fixed effects ( $\beta = -0.234$ ;  $p < 0.10$ ), and also with firm and industry-year fixed effects ( $\beta = -0.240$ ;  $p < 0.10$ ) in model 7A. Models 6C and 7C offer empirical evidence supporting a significant interaction effect of private shareholder

TABLE 2 Descriptive statistics and correlations.

	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Environmental Innovation Score	22.478	29.664	1.000													
(2) Emissions proposals presented	0.022	0.15	0.045***	1.000												
(3) Emissions proposals withdrawn	0.008	0.09	0.012	0.591***	1.000											
(4) Energy proposals presented	0.018	0.168	0.083***	0.135***	0.028**	1.000										
(5) Energy proposals withdrawn	0.006	0.075	0.025**	0.002	-0.007	0.441***	1.000									
(6) Community proposals presented	0.018	0.156	0.118***	0.127***	0.040***	0.207***	0.027**	1.000								
(7) Community proposals withdrawn	0.005	0.072	0.047***	-0.009	-0.006	0.028**	0.021*	0.493***	1.000							
(8) Reporting proposals presented	0.018	0.145	0.066***	0.183***	0.076***	0.161***	0.017	0.154***	0.033***	1.000						
(9) Reporting proposals withdrawn	0.005	0.071	0.028**	0.042***	0.038***	0.051***	0.021*	0.080***	0.078***	0.539***	1.000					
(10) Strictly independent board members	49.353	18.637	0.052***	0.038***	0.026**	0.022*	-0.008	0.040**	-0.001	0.018	0.017	1.000				
(11) Employees	8.876	1.772	0.240***	0.063***	0.027**	0.051***	0.016	0.110***	0.049***	0.071***	0.044***	-0.011	1.000			
(12) Total revenue	21.913	1.532	0.340***	0.157***	0.067***	0.108***	0.056***	0.173***	0.065***	0.149***	0.084***	0.011	0.684***	1.000		
(13) ROE	15.086	14.711	0.073***	0.009	0.007	-0.001	0.004	0.028**	0.034***	-0.038***	-0.008	-0.034***	0.206**	0.265***	1.000	
(14) Shareholder rights	0.933	0.202	0.080***	-0.003	0.010	0.015	-0.008	0.010	0.014	0.016	0.014	0.059***	-0.033**	-0.067***	-0.014	1.000

\*p < 0.1. \*\*p < 0.05. \*\*\*p < 0.01.

**TABLE 3** Influence of board independence on firms' environmental innovations.

	Model 1	Model 2	Model 3
Independent variables			
Strictly independent board members		−0.014 (0.025)	0.009 (0.025)
Control variables			
Employees	0.283 (0.289)	0.283 (0.289)	0.229 (0.288)
Total revenue	1322 (−1.278)	1312 (−1.276)	1340 (−1.225)
ROE	−0.025 (0.025)	−0.025 (0.025)	−0.035 (0.025)
Shareholder rights	8.676* (−4.872)	8.659* (−4.868)	15.513*** (−5.046)
Constant	−40,245 (−27.465)	−39,439 (−27.455)	−3236.420*** (−333.752)
R-squared	0.139	0.139	0.124
Observations	7111	7111	7111
Firms	1249	1249	1249
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	
Year × Industry fixed effects			Yes

Note: Standard errors are in parentheses.

\* $p < 0.1$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

activism when measuring this activism through “community proposals” ( $\beta = 0.312$ ;  $p < 0.05$  firm-year fixed effects;  $\beta = 0.331$ ;  $p < 0.05$  firm-year-industry fixed effects) and “reporting proposals” ( $\beta = 0.437$ ;  $p < 0.10$  firm-year fixed effects) in model 6D. In our analysis of “energy proposals,” our results did not reveal any significant interaction effect of shareholders' environmental activism.

To facilitate the interpretation of the interaction effect of shareholders' environmental activism, we present a plot of the relationship between board independence and environmental innovation in Figures 1–5. Specifically, Figures 1 and 2 indicate that the positive effect of independent boards on environmental innovation is more pronounced for firms with higher levels of public shareholders' environmental activism regarding “community proposals” and “reporting proposals.” These results support our Hypothesis H2 when proposals address community and reporting topics.

Figure 3 shows the interaction effect of private shareholders' environmental activism on the relationship between board independence and environmental innovation when firms deal with environmental shareholder proposals related to emissions topics. This figure shows a negative effect of board independence on environmental innovations when higher levels of private shareholders' environmental activism regarding emissions are present. Conversely, for lower levels of private activism regarding emissions, no significant changes are observed in the relationship between board independence and environmental innovations. In Figures 4 and 5, we illustrate how private shareholders' environmental activism acts as a catalyst in the

relationship between private shareholders' environmental activism and board independence, for both “community” and “reporting proposals.” However, our Hypothesis H3, which predicted a negative moderating effect, is only supported for private shareholders' environmental activism resulting from “emissions proposals.” Thus, we partially accept Hypothesis H3.

## 5.1 | Robustness checks

In order to tackle any endogeneity concerns, we additionally employed several methodological approaches. First, we refined the public shareholders' environmental activism variable by restricting it to only the proposals that reached the final voting stage. After this change, our results remained consistent. Second, we checked whether our results were robust to changes in the sample. Although the S&P 1500 index covers most of the US market capitalization, the S&P 500 is designed to exclusively capture the 500 leading firms. Therefore, we conducted additional analyses using only the top leading firms, and the results remained consistent with the initial findings. This evidence confirms the consistency of the effects, not only for the overall US market but also for the top firms specifically. Third, we also ran the regressions considering only those firms that were stably part of the S&P 1500 index throughout the entire period (2016–2019). This involved manually checking adds and drops to the index during this time, resulting in a sample of 833 firms (5995 observations). Our



**TABLE 4** Influence of board independence on firms' environmental innovations and the moderating effect of public shareholder activism.

	Emissions proposals		Energy proposals		Community proposals		Reporting proposals	
	Model 4A	Model 5A	Model 4B	Model 5B	Model 4C	Model 5C	Model 4D	
<b>Independent variables</b>								
Strictly independent board members	−0.016 (0.025)	0.007 (0.026)	−0.015 (0.025)	0.008 (0.025)	−0.019 (0.025)	0.004 (0.026)	−0.018 (0.026)	0.005 (0.026)
Proposals presented	−4.955 (−5.552)	−5.462 (−5.790)	2.483 (−4.243)	3.858 (−4.310)	−7.734** (−3.664)	−6.391 (−4.042)	−9.688 (−6.618)	−10.495 (−7.075)
Strictly independent board members × Proposals presented	0.111 (0.134)	0.111 (0.143)	0.036 (0.073)	0.021 (0.071)	0.218*** (0.067)	0.211*** (0.067)	0.218* (0.123)	0.208 (0.131)
Proposals withdrawn	−2.288 (−3.850)	−2.432 (−4.023)	−2.107 (−2.419)	−3.266 (−2.437)	−5.339 (−3.542)	−5.369 (−3.723)	−5.930* (−3.445)	−5.252 (−3.566)
<b>Control variables</b>								
Employees	0.282 (0.289)	0.228 (0.289)	0.277 (0.289)	0.223 (0.288)	0.273 (0.289)	0.220 (0.288)	0.279 (0.289)	0.227 (0.288)
Total revenue	1.310 (−1.267)	1.341 (−1.217)	1.293 (−1.274)	1.326 (−1.223)	1.125 (−1.229)	1.146 (−1.182)	1.307 (−1.271)	1.332 (−1.221)
ROE	−0.026 (0.025)	−0.035 (0.025)	−0.025 (0.025)	−0.034 (0.025)	−0.023 (0.025)	−0.032 (0.025)	−0.026 (0.025)	−0.035 (0.025)
Shareholder rights	8.701* (−4.875)	15.552*** (−5.047)	8.653* (−4.864)	15.403*** (−5.041)	8.816* (−4.853)	15.558*** (−5.030)	8.758* (−4.873)	15.610*** (−5.046)
Constant	−39.305 (−27.231)	−3240.94*** (−334.819)	−38.893 (−27.403)	−3228.45*** (−333.319)	−35.209 (−26.441)	−3249.67*** (−331.105)	−39.058 (−27.307)	−3235.46*** (−332.847)
R-squared	0.139	0.125	0.140	0.126	0.142	0.127	0.140	0.125
Observations	7111	7111	7111	7111	7111	7111	7111	7111
Firms	1249	1249	1249	1249	1249	1249	1249	1249
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes		Yes		Yes		Yes	
Year × Industry fixed effects		Yes		Yes		Yes		Yes

Note: Standard errors in parentheses.

\* $p < 0.1$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

results remained consistent even considering only these firms. Additionally, we also included a variant of models 2, 4, and 6 including industry-by-year fixed effects to attain any industry-specific trends following previous literature (Flammer et al., 2021; Lee, 2020) resulting in models 3, 5, and 7. Furthermore, we ran a robustness test by lagging the dependent variable by 1 year, and the direction of the relationships under study remained unchanged. Notwithstanding, it is worth mentioning that the moderating influence of public activism yields mixed findings when our dependent variable is lagged, as they seem to have a more short-sighted orientation than lagged effects.

Finally, we tested our three hypotheses through the estimation of regressions where the dependent variable is regressed on core variables as well as every possible combination of secondary variables (details in the Supporting Information). Recent studies have emphasized the potential of this approach to provide a systematic

verification of the robustness in regression analysis (e.g., Ellimäki et al., 2022; Omezzine & Freitas, 2022). Specifically, we performed a sensitivity analysis of the independent explanatory variables (Neumayer & Plümpert, 2017) by using the checkrob module in the Stata 16 (Barslund, 2007).

We selected “board independence” as a core variable in our models, and we also included the interaction terms to assess their impact. As a result, these analyses enabled us to test the robustness of the relationship between firms' environmental innovations and board independence, moderated by shareholders' environmental activism, and also to determine whether it was resistant to changes in model specification. The results are presented in the Supporting Information, which includes sensitivity analysis on both core variables and secondary variables. Columns (a)–(c) exhibit the maximum, minimum, and average of the point estimates, while column (d) shows the

**TABLE 5** Influence of board independence on firms' environmental innovations and the moderating effect of private shareholder activism.

	Emissions proposals		Energy proposals		Community proposals		Reporting proposals	
	Model 6A	Model 7A	Model 6B	Model 7B	Model 6C	Model 7C	Model 6D	Model 7D
Independent variables								
Strictly independent board members	−0.013 (0.025)	0.011 (0.025)	−0.015 (0.025)	0.008 (0.025)	−0.017 (0.025)	0.006 (0.025)	−0.016 (0.025)	0.008 (0.025)
Proposals presented	0.803 (−3.467)	0.301 (−3.588)	4.433*** (−1.538)	5.026*** (−1.669)	5.290* (−3.178)	6.187* (−3.219)	1.101 (−2.291)	−0.215 (−2.551)
Proposals withdrawn	10.481 (−9.024)	10.627 (−9.319)	−3.728 (−5.136)	−5.428 (−5.156)	−22.747** (−8.977)	−23.613** (−9.179)	−28.598** (−13.957)	−23.948* (−14.236)
Strictly independent board members × Proposals withdrawn	−0.234* (0.138)	−0.240* (0.142)	0.029 (0.093)	0.042 (0.086)	0.312** (0.153)	0.331** (0.155)	0.437* (0.224)	0.363 (0.229)
Control variables								
Employees	0.289 (0.289)	0.234 (0.289)	0.277 (0.289)	0.222 (0.288)	0.277 (0.289)	0.222 (0.288)	0.288 (0.289)	0.235 (0.288)
Total revenue	1.295 (−1.275)	1.328 (−1.224)	1.293 (−1.274)	1.325 (−1.223)	1.212 (−1.237)	1.230 (−1.185)	1.251 (−1.268)	1.291 (−1.222)
ROE	−0.025 (0.025)	−0.034 (0.025)	−0.025 (0.025)	−0.034 (0.025)	−0.025 (0.025)	−0.034 (0.025)	−0.026 (0.025)	−0.035 (0.025)
Shareholder rights	8.630* (−4.878)	15.496*** (−5.049)	8.654* (−4.865)	15.400*** (−5.041)	8.814* (−4.857)	15.563*** (−5.034)	8.707* (−4.877)	15.635*** (−5.054)
Constant	−39.136 (−27.429)	−3236.81*** (−336.220)	−38.897 (−27.407)	−3228.81*** (−333.365)	−37.170 (−26.595)	−3236.59*** (−332.006)	−38.169 (−27.265)	−3239.17*** (−333.029)
R-squared	0.139	0.125	0.140	0.126	0.141	0.127	0.140	0.125
Observations	7111	7111	7111	7111	7111	7111	7111	7111
Firms	1249	1249	1249	1249	1249	1249	1249	1249
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes		Yes		Yes		Yes	
Year × Industry fixed effects		Yes		Yes		Yes		Yes

Note: Standard errors in parentheses.

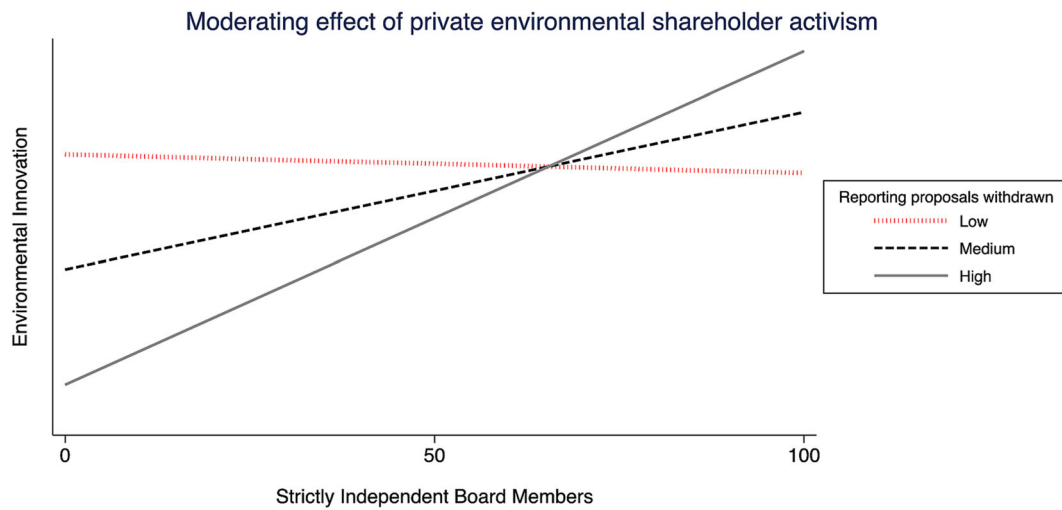
\* $p < 0.1$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

average standard deviation. Subsequently, columns (e)–(f) present the key findings of the sensitivity analysis, reporting the percentage of regressions in which the point estimate achieves significance at the 5% level and the percentage of positive and negative point estimates, respectively. Lastly, column (h) shows the average  $t$ -value over all regressions, and column (i) provides the number of estimated models. Overall, table 6 confirms that the core variables used in our models are robust, as board independence and the interaction terms show no sign changes in any combination with secondary variables.

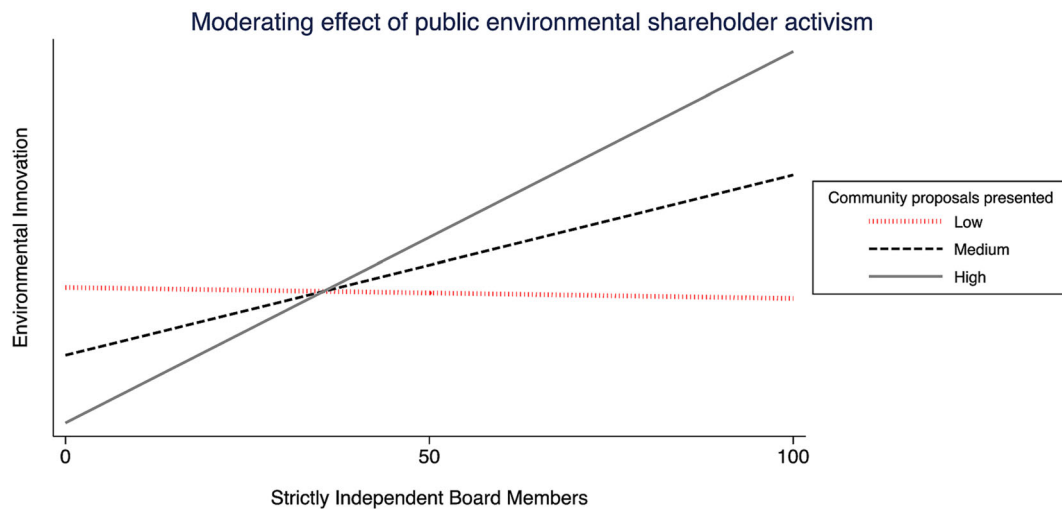
## 6 | DISCUSSION

Corporate environmental approaches have been among the main concerns of society over the last few decades. In this paper, we

analyze the role of independent directors and emergent shareholders' environmental activism on firms' environmental innovations. Using a dataset of firms from the S&P 1500 index throughout 2006–2019, with 7111 firm-year observations. We find that a greater proportion of independent directors does not have a significant effect on a firm's environmental innovations. These results are in line with some of the previous findings in the literature that suggests independent directors have mixed interests in environmental developments (Amran et al., 2014; De Villiers et al., 2011; Galbreath, 2010; Garcia-Martín & Herrero, 2020). However, our analysis of the moderating effect of shareholders' environmental activism confirms the importance of a more fine-grained analysis of the relationship between board independence and environmental innovations. Specifically, we find that the moderating influence of public and private shareholders' environmental activism connected to certain visible environmental



**FIGURE 1** Public shareholders' environmental activism and its moderating effect on the relationship between board independence and firms' environmental innovations—community proposals.



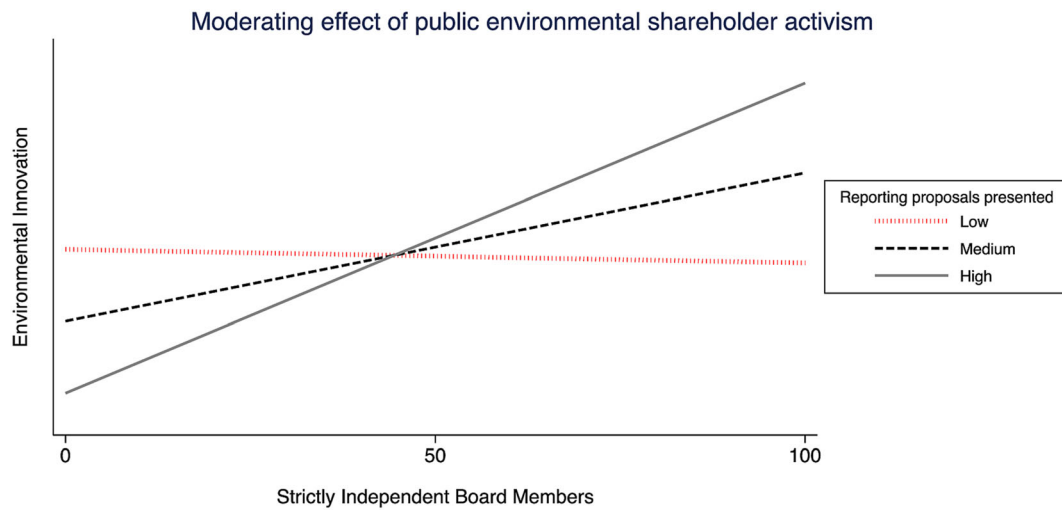
**FIGURE 2** Public shareholders' environmental activism and its moderating effect on the relationship between board independence and firms' environmental innovations—reporting proposals.

topics helps us understand the limited significance of the direct effect.

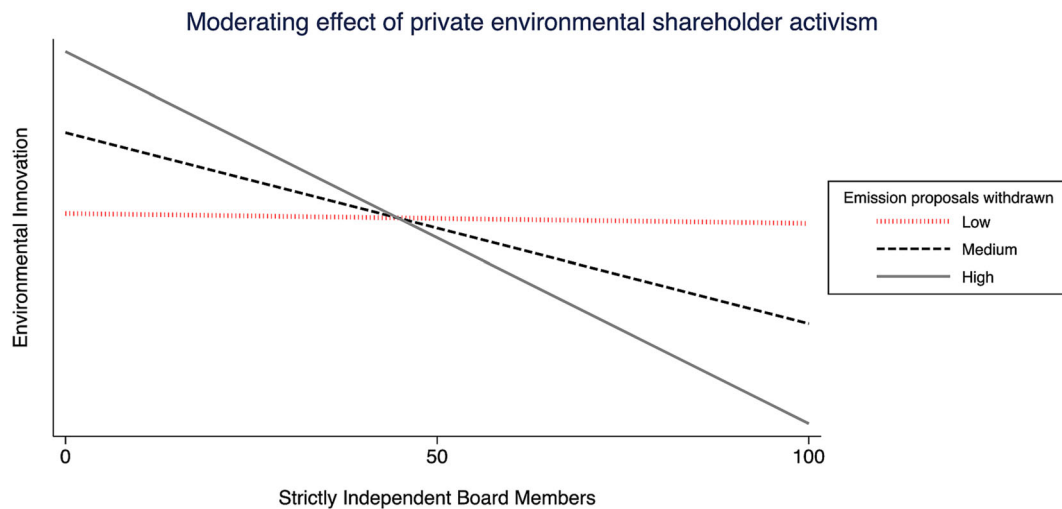
Our moderating regression analysis revealed that the sign of the relationship between independent boards and firms' environmental innovation changes based on the type of shareholder activism, public or private, and the interests of the shareholder activist—"community," "reporting," "emissions," or "energy." In this context, a statistically limited value of the direct relationship emphasizes the importance of analyzing these factors separately. On the one hand, our findings show that public shareholders' environmental activism related to community and reporting issues reinforces the positive impact of board independence on firms' environmental innovations. This result is congruent with our expectations of a positive influence of public environmental activism on the relationship between board independence and independent directors. However, our results did not show a

statistically significant effect of public activism related with the less visible topics of energy and corporate emissions. On a similar note, incorporating a 1-year lag to the environmental innovation variable yielded related results; however, the significance level diminished, revealing a short-term effect associated with this type of activism. These findings contribute to the overall significance of our study focused on the impact of visibility associated in activists' proposals by suggesting that the visibility of public proposals makes a stronger effect on the short term. Meanwhile, the more consistent effect of agreements between executives and activists through private activism needs more time to be noticed.

On the other hand, our results show that private environmental activism weakens the positive relationship between independent directors and environmental innovations, as proposed in our hypothesis, but only when activism is connected with internal "emissions."



**FIGURE 3** Private shareholders' environmental activism and its moderating effect on the relationship between board independence and firms' environmental innovations—emissions proposals.



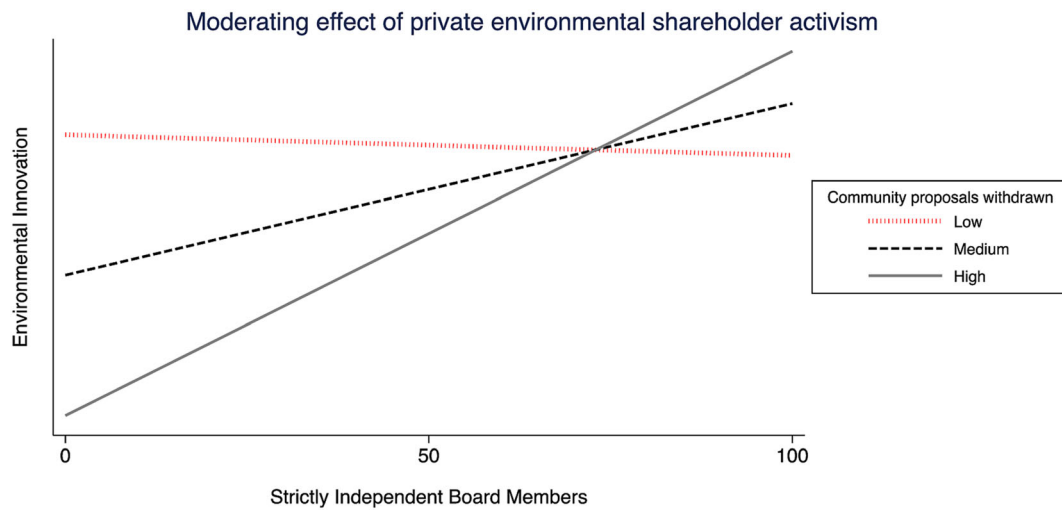
**FIGURE 4** Private shareholders' environmental activism and its moderating effect on the relationship between board independence and firms' environmental innovations—community proposals.

However, contrary to our expectations, we also found that private activism connected with the most visible environmental topics of “society” and “reporting” reinforces positively the role of independent directors. One potential explanation for this result is related to the concern of independent directors to uphold a good reputation and cultivate strong networks with external agents to safeguard their own professional interests (Gerged, 2021). Consequently, shareholders' environmental activism when it is associated with the most highly visible topics reinforces the positive impact of board independence on corporate environmental innovations because directors are sensitive to the reputational effects of stakeholders' attention to environmental topics with high external visibility.

In other words, both public and private shareholder activism connected with community and reporting topics positively moderate the influence of independent directors on environmental innovations.

Meanwhile, private shareholder activism moderates negatively that influence, but only for topics connected to internal operations. These results reinforce the relevance of visible environmental activism on the influence of independent directors by including not only the nature of the activism—public or private—as originally proposed in our hypotheses, but also the nature of the involved topics.

This study contributes to several strands of the literature. First, we extend the agency perspective of boards by linking board influence to interests beyond the traditional dialectics of shareholders versus executives. Specifically, we answer the calls to better understand the growing importance of shareholders' environmental activism (Eccles et al., 2020; Flammer et al., 2021) by considering their influence on the effectiveness of board independence. Furthermore, we highlight the importance of considering the independent directors' own reputational interests (Cowen & Marcel, 2011; Li et al., 2018;



**FIGURE 5** Private shareholders' environmental activism and its moderating effect on the relationship between board independence and firms' environmental innovations—reporting proposals.

Marcel & Cowen, 2014). Our results extend previous agency analyses on how directors do not only preserve their shareholders' priorities but also have their own interests (Cowen & Marcel, 2011; Li et al., 2018; Marcel & Cowen, 2014) by paying an apparent extra attention to environmental claims with external visibility.

Second, we contribute to the mixed literature regarding the influence of the board on firms' environmental sustainability (Aguilera et al., 2022; Finegold et al., 2007; Neville et al., 2019; Walls et al., 2012) and their sensitivity to contingent influences (Bonini et al., 2021; Wang et al., 2019; Witt et al., 2021). While previous literature has mostly examined the independent directors' monitoring capacity to avoid biased managerial financial decisions in the environmental arena (Neville et al., 2019; Walls et al., 2012), our results open up opportunities for analyzing the potential of certain directors and shareholders to preserve the natural environment beyond the short-term business case of corporate sustainability. Specifically, independent directors may prefer to avoid personal reputational risks by allowing firms to invest more in environmental innovations rather than what speculative shareholders might prefer. However, their environmental interests might well match with those of other long-term investors or even with external stakeholders.

Third, we extend the environmental contingent view (Aragón-Correa & Sharma, 2003) of board governance (Bonini et al., 2021; Desender et al., 2013; Li et al., 2018; Wang et al., 2019; Witt et al., 2021) by independently analyzing two different forms of shareholders' environmental activism: public and private (Goranova & Ryan, 2014). Public activism, which is associated with more confrontational stances and the potential risk of damaging a firm's reputation, has traditionally received more attention in the environmental management literature (e.g., Flammer et al., 2021; Reid & Toffel, 2009). However, private activism has been recognized as the most frequent form of activism in firms (Goranova & Ryan, 2014). Private activism limits the risks of damaging firms' and directors' reputations, making it tempting for executives to avoid additional public initiatives by

achieving most of the changes and reforms pursued by private activists. Furthermore, our findings confirm that the specific nature of the topics connected to public and private activism has very distinct implications for the firm. Independent directors and executives seem to be more inclined to consider activism with high visibility than other claims, but their roles are less relevant when executives and activists develop private negotiations regarding internal operations. These results reinforce the need to pay extra attention to how executives should deal with different forms of activism and raise doubts regarding the preservation of general shareholders' interests versus the interests of activist shareholders, which in turn follow private paths to make an influence without public scrutiny.

Our results have some relevant implications for practitioners. Executives should be aware that different shareholders and directors are pushing firms toward improving their environmental innovations. Regarding investors, the growing importance of shareholders worried simultaneously about the firms' financial performance and also about the sustainability implications of their operations (e.g., multiple institutional investors, including pension funds and leaders in the industry) deserves some extra consideration. On this behalf, our results confirm that independent directors are specially sensitive to their environmental interests when they are externally visible. These results suggest the importance of the reputational implications of environmental claims for independent directors and executives.

Our study also offers relevant evidence for practitioners regarding the effectiveness of activism in firms. While the vast majority of the activists' proposals are rejected, our results confirm that executives and directors feel the pressure of environmental proposals to make progress in related topics. Additionally, our results show that executives make relevant efforts to satisfy the concerns of critical shareholders. Specifically, almost 40% of the analyzed shareholder proposals were withdrawn by the shareholders prior to voting, which suggests that executives have made agreements with the activists to avoid extra publicity for the said proposal. Along these lines, our

results suggest that executives feel that it is essential to protect firms' reputations by promoting private engagement dialogues with shareholders and improving firms' environmental innovations. In practice, our results confirm that executives need to react more intensively to environmental pressures when independent directors and environmentally activist shareholders are vigilant.

This study is not without limitations. Our results should be interpreted with caution outside the scope of Anglo-American corporate governance, where other corporate governance mechanisms may be used to align the interests of the firm, shareholders, and other stakeholders. Therefore, while acknowledging the relevance of submitting shareholder proposals, alternative ways of public shareholder activism might be more effective in different institutional contexts (e.g., investors' tactical movements, public interviews, or notes in the media, among others). Furthermore, we recognize that private activism is per se hard to measure; there is no accurate way to measure all potential confidential conversations, as there is no record or document that registers them happening or tracks the subject discussed. Although we use a well-accepted variable to measure private activism, we recognize that checking the potential impact of alternative approaches to measure activism and analyzing specific individual cases or industries might be useful in the future.

In terms of future research, it would be interesting to expand our analysis beyond the firms' environmental innovations and investigate whether the visibility of other corporate sustainability dimensions may or may not influence the effect of board independence on firms' social performance under the influence of shareholder activism. Additionally, a potential research opportunity would be to explore a broader delimitation of independent board members. Moreover, future research should look at the temporal implications of activism, particularly in terms of lagged effects. Our findings indicate a tendency for public activism to exhibit more short-sighted effects compared with private activism; therefore, investigating the time dimension of activism would provide valuable insights for understanding its long-term impact. Another field to be explored is the influence of shareholders' environmental activism over time on the link between board independence and environmental innovations. This could include not only the most immediate influence of environmental activism on the effectiveness of board independence but also whether the historical record of environmental activism has resulted or not in a more (or maybe less) sensitive approach to the topics within the proposals. Finally, given the potential influence of institutions, future research could benefit from further examination of the institutional setting of activist shareholders and their profiles.

## 7 | CONCLUSION

Drawing on agency theory and the new literary stream focused on independent directors' own interests, our study contributes to the literature by analyzing the influence of shareholders' environmental activism on the role of independent directors. Specifically, we find

that firms facing significant shareholders' environmental activism connected to highly visible topics achieve greater corporate environmental innovations under the presence of more independent board members. Interestingly, our results are consistent both for public shareholder activism, as represented by shareholder proposals, and private activism, as reflected by negotiations that lead to the withdrawal of shareholder proposals. In addition, we find that private activism focused on less visible environmental topics reduces the influence of board independence on environmental innovations. Our results suggest that the potential reputational effects of highly visible environmental topics reinforce the voice of independent directors in the governance of corporate environmental innovations. These results are particularly relevant because the future of society depends heavily on firms' ability to develop innovations to reduce the negative impact of their daily operations.

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