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The lines that divide: Board demographic faultlines and proactive environmental strategy

Claudia Arena[1] | Nicolas Garcia-Torea[2] | Giovanna Michelon[3]

[1]Department of Economics, Management and Institutions, University of Naples Federico II, Naples, Italy

[2]Departamento de Economía y Administración de Empresas, Universidad de Burgos, Burgos, Spain

[3]University of Bristol Business School, University of Bristol, Bristol, UK

Correspondence

Nicolas Garcia-Torea, Departamento de Economía y Administración de Empresas, Universidad de Burgos, Burgos, Spain.
Email: ngtorea@ubu.es

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Abstract

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Research Question/Issue: The current ecological crisis requires boards of directors to tackle environmental concerns and manage dependencies with the external environment in highly dynamic conditions. Proactive environmental strategies (PESs) seek to establish alternative and innovative processes and products that create new market opportunities. By mobilizing the notion of board demographic faultlines, we investigate their link with PESs and the influence of the internal board dynamics and environmental factors on this relationship.

Research Findings/Insights: The multilevel regression analysis of a 7-year sample of UK boards reveals that demographic faultlines hinder their information processing in adopting PESs. The results also show that the negative relationship between demographic faultlines and PESs is attenuated by the social similarity of the CEO and chair in the same subgroup and by the financial materiality of the natural environment.

Theoretical/Academic Implications: This study draws on faultline theory to analyze how the structure of board diversity through the alignment of multiple directors' demographic attributes affects board dynamics by creating polarized boards that shape sustainability decisions. This study underscores the disruptive effect of having socially distanced subgroups within the board and the salience of board leaders' social similarity and environmental factors in attenuating their dysfunctional effects.

Practitioner/Policy Implications: Board diversity is considered key to improving board decision-making. By situating our empirical investigation in a country with a corporate governance model that fosters diversity in a dual leadership board structure that has influenced other countries' governance models, this study provides insights for policymakers and market participants on the unintended effects of the global call for board diversity on firms' proactive environmental stance. Our results call for establishing procedures to incentivize board socialization and facilitate directors' information processing.

KEYWORDS

corporate governance, board of directors, environmental factors, environmental strategies, faultlines

1 | INTRODUCTION

The current ecological crisis requires efforts by all parties in society to address the key issues that can make the planet a "safe operating space for humanity" (Rockström et al., 2009). Firms are crucial players in this context because of the increasing recognition of their dependencies on the natural environment and their negative (more often than positive) impacts on the planet's ecological stability (Unerman et al., 2018). Despite the growing relevance of sustainability on the board's agenda (Jamali et al., 2008; Rao & Tilt, 2016), the lack of a comprehensive understanding of the corporate governance of environmental sustainability remains. This is often defined as "those behaviors and strategies that reflect a firm's distribution of rights and responsibilities around environmental sustainability issues" (Aguilera et al., 2021, p. 1469). This includes, among others, the role of board diversity in ensuring a healthy debate on environmental strategies.

Research has only begun to examine how the alignment of diversity attributes within organizational teams influences green technologies (Ma et al., 2021), neglecting the internal dynamics depending on both corporate, such as leadership, and environmental factors (Wangrow et al., 2015). Notably, little is known about the influence of boards' configurational structure on the implementation of proactive environmental strategies (PESs) (Ortiz-de-Mandojana et al., 2012; Sharma & Vredenburg, 1998) under different leadership structures and contextual conditions (Wangrow et al., 2015). PESs aim to create new market opportunities by developing alternative, innovative environmental technologies and processes or sustainable products and are fundamental for the transition to sustainability (Aragón-Correa & Sharma, 2003; Sharma, 2000). Hence, it is important and timely to understand how different board configurations influence their implementation.

We apply the notion of faultlines (Lau & Murnighan, 1998) to conceptualize the social dynamics behind board's subgrouping based on the alignment of two demographic attributes (gender and age) (Leicht-Deobald et al., 2021) that are the most relevant in driving environmental outcomes (Kumar & Paraskevas, 2018) and to disentangle which board configuration is more or less beneficial for firms to engage in PESs. Faultlines refer to the "hypothetical dividing lines that may split a group into subgroups based on one or more attributes" (Lau & Murnighan, 1998, p. 328). Decisions on PESs are typically strategic and require board discussions. They imply an anticipatory approach to seize opportunities to create new environmentally friendly businesses (Marcus & Fremeth, 2009) and improve environmental effectiveness and efficiency (Berry & Rondinelli, 1998) through research and development (Sharma & Vredenburg, 1998). They are technically and socially complex because they entail a redesign and reconfiguration of firms' resources and innovation processes (Russo & Fouts, 1997), which require the involvement of multiple actors at different corporate levels, including the board (Aragón-Correa, 1998). Thus, implementing PESs should be agreed upon within the board because it is a long-term decision requiring a shared organizational vision (Aragón-Correa & Sharma, 2003). Demographic faultlines have clear team-splitting power (Wu et al., 2021) because they are based on directly visible or class-based markers, such as gender (Richard et al., 2019), leading to negative social interaction among board subgroups due to categorization, stereotyping, and prejudice (Crucke & Knockaert, 2016). Moreover, these attributes account for directors' different values and views on sustainability (Byron & Post, 2016; Endrikat et al., 2021; Ludwig & Sassen, 2022). Therefore, demographic faultlines might polarize boards, creating highly distanced "psychological groups" (Leicht-Deobald et al., 2021) that reduce the likelihood of directors agreeing to implement PES. Further, we posit that the extent to which strong demographic faultlines unfold depends on some salient features of internal and external context (i.e., corporate leaders' position relative to faultlines and the financial materiality of the natural environment).

We test our hypotheses using a sample of UK firms from 2011 to 2017. The United Kingdom represents an interesting case as its Corporate Governance Code guarantees similar corporate governance arrangements during the period analyzed across firms, while encouraging board diversity and nudging boards to incorporate environmental issues into corporate strategies (see Companies Act, 2006; Financial Reporting Council, 2018). Additionally, the United Kingdom provides a suitable context to analyze the influence of leaders' position relative to faultlines as it is characterized by a "dual leadership" structure where the board chair and CEO positions are usually held by different individuals (Financial Reporting Council, 2018).

We employ a multilevel analysis that accounts for the nested/crossed structure of the data and find that the board is less prone to engage in PESs when the alignment of director's age and gender generates demographic faultlines. This result supports the idea that the potential conflicting subgroups driven by faultlines obstruct the board decision-making process on PESs. Additionally, we document that some salient features of firms' leadership and environmental conditions shape the role of faultlines in PESs. We find that the negative relationship between demographic faultlines and PESs is attenuated when faultlines create a configuration with one powerful and resourceful subgroup characterized by a high social similarity of the CEO and Chair. We also report that polarized board are more likely to overcome the disruptive effect of faultlines on PES in contexts where ecological aspects are more likely to affect firm's financial performance (i.e., the natural environment is financially material).

This investigation contributes to the literature in three ways. First, informed by demographic faultlines (Lau & Murnighan, 1998) to study board dynamics (Huse, 2007), our investigation highlights the importance of social interactions within and across board subgroups in shaping the likelihood of firms adopting PES. Specifically, we respond to calls for models that analyze the combined effect of board attributes to better understand the link between board demographic attributes and sustainability-related outcomes (Aguilera et al., 2021; Endrikat et al., 2021; Ludwig & Sassen, 2022; Rao & Tilt, 2016). We combine directors' gender and age because they are the most relevant attributes in setting the board's green agenda (Kumar & Paraskevas, 2018) and represent the most significant demographic catalysts of directors' subgrouping (Crucke & Knockaert, 2016; Vandebeek et al., 2021). Therefore, we go beyond studies exploring the effect of one attribute (e.g., female directors) on board outcomes (see Endrikat et al., 2021, for a literature review on the link between board characteristics and corporate social responsibility—CSR hereafter). Most literature on board diversity indicates that the presence of female and/or young directors enhances CSR (Rao & Tilt, 2016). In this respect, studies that consider diversity as the distribution of these demographic characteristics across directors (e.g., board resource variety) suggest that diversity can improve board functioning (Barroso-Castro et al., 2022; Farooq et al., 2023). By conceptualizing demographic faultlines beyond the stand-alone consideration of gender (Wu et al., 2021), we capture the *structure* of boards' subgroups arising from the combination of two distinct demographic attributes (Molleman, 2005). We show that an excessive *alignment* of age and gender (e.g., when all women are old and all men are young in a board) creates a diversity configuration polarizing boards in distinctive distanced subgroups that disrupt the board dynamics with unintended effects on corporate sustainability decisions beyond the already documented implications of faultlines on performance and innovation (Leicht-Deobald et al., 2021; Richard et al., 2019).

Second, this study extends research on the role of team leaders in handling the effects of demographic faultlines (Gibson & Vermeulen, 2003; Li & Liu, 2022; Meyer et al., 2015) and driving CSR investments (García-Sánchez & Martínez-Ferrero, 2019; Ortiz-de-Mandojana et al., 2019). Prior studies have analyzed the configurational properties of subgroups (Carton & Cummings, 2013; Crucke & Knockaert, 2016; Qi et al., 2022) outlining the importance of CEO's position relative to faultlines when examining its influence on technological innovation (Li & Liu, 2022). Despite the undoubtful CEO's role in effectively leading the corporate strategy, strategic leadership scholars are recently focusing on the centrality of the Chairperson-CEO interaction, especially in governance regimes where these roles are held separate, such as the United Kingdom (Morais et al., 2020). While the CEO is commonly considered the most powerful entrepreneurial leader (Cannella et al., 2009), the Chair is considered the formal governance leader (Krause et al., 2019) with increasing responsibilities on the firm's strategic direction (Banerjee et al., 2020). Our results advance this line of research by exploring faultline dynamics in a context where these two powerful individuals stand out to influence the dynamics and decision-making of the board.

Third, our study emphasizes the salience of contextualizing the relationship between demographic faultlines and strategic outcomes to unravel the literature's ambiguous results on the interaction between external sources of managerial discretion and internal board activity (Wangrow et al., 2015). Research shows that environmental conditions shape the benefits of board monitoring of CSR (García-Sánchez, 2020). In line with studies on the contingent effect of faultlines (Kaczmarek et al., 2012a; Van Peteghem et al., 2018), we demonstrate that the external environment alters the extent to which demographic faultlines affect the board's role in advising about environmental strategies. We extend research on how environmental factors affect the influence of faultlines on strategic decision-making (Cooper et al., 2014; Richard et al., 2019) by exploring an environmental condition that differs from the more common market-related features (e.g., complexity, dynamism, and munificence) and that arises from a closer connection between economic activities and nature: the natural environment's financial materiality. We document that this factor is a pivotal environmental condition that moderates the dysfunctional role of faultlines in PES, thereby bridging strategic management research and studies on environmental externality reporting (Unerman et al., 2018).

Our study has relevant policymaking and managerial implications. Corporate governance codes are incorporating recommendations to foster gender diversity and enhance board functioning (Elsayed et al., 2022). Our evidence enables policymakers and market participants to assess the potential side effects of diversity in the boardroom for a proactive environmental strategic stance before pressuring the board's configuration via listing requirements or the "voice" channel. Our results suggest the need to establish procedures to manage diversity and facilitate the board's information processing through socialization to leverage the positive inputs of diversity and avoid the detrimental influence of subgroup polarization driven by demographic faultlines.

2 | THEORY AND HYPOTHESES

2.1 | Board of directors and environmental decisions: from diversity to faultlines

Research on the relationship between boards of directors and environmental strategies has explored the link between diversity in directors' attributes and CSR decisions (Aguilera et al., 2021; Endrikat et al., 2021). This literature, mainly informed by resource dependence (Pfeffer & Salancik, 1978) and upper-echelon theories (Hambrick & Mason, 1984), investigates the influence of several directors' attributes. Gender diversity is undoubtedly the most widely studied (Byron & Post, 2016; Endrikat et al., 2021; Ludwig & Sassen, 2022). Women are considered more environmentally concerned and engaged in developing environmental policies than men (Nielsen & Huse, 2010). They are also more sensitive to others and are prone to integrate multiple stakeholders' perspectives in the boardroom (Ludwig & Sassen, 2022; Terjesen et al., 2009). The diversity in directors' age is another relevant demographic attribute that has been investigated as a proxy for directors' environmental consciousness (Beji et al., 2021; Hafsi & Turgut, 2013; Post et al., 2011). Overall, this stream of literature reports mixed findings (Endrikat et al., 2021; Rao & Tilt, 2016). Most studies have analyzed directors' attributes individually without considering their interconnection (Endrikat et al., 2021). A few authors have attempted to build constructs capturing the combined effect of multiple characteristics, suggesting that the higher the value of the construct, the higher the board's environmental orientation (Helfaya & Moussa, 2017). However, such aggregated constructs fail to consider the *structure* of diversity (Molleman, 2005) and the extent to which the distribution of attributes may lead to creating distinct "psychological groups" within the board (Leicht-Deobald et al., 2021), which may influence its decision-making.

We mobilize the concept of group faultlines to advance our understanding of how the distribution of directors' attributes affects board decision-making (Crucke & Knockaert, 2016). As proposed by Lau and Murnighan (1998), faultlines capture the emergence of subgroups in a team because of the alignment of individuals' attributes and their influence on workgroup processes and outcomes. This notion combines insights from different frameworks such as social identity, self-categorization, optimal distinctiveness, and distance theories (Thatcher et al., 2003; Thatcher & Patel, 2012). Individuals self-categorize themselves into subgroups with characteristics similar to their own (Tajfel & Turner, 1986). This categorization fosters a link between the self and the subgroup's self so that individuals enhance their subgroup's salience to promote their image, creating faultlines that divide a team into subgroups with similar characteristics (Thatcher & Patel, 2012). Strong faultlines appear when attributes align, creating distinctive subgroups (Meister et al., 2020). The formation of subgroups fosters a self-distancing process (Jetten et al., 2004) in which individuals highlight their similarity to members of their subgroups (in-group favoritism) and emphasize their differentiation from other subgroups (outgroup discrimination) (Richard et al., 2019). This configuration could lead to conflicts within a team because members of a subgroup feel more comfortable within their in-subgroup, while the existence of other subgroups may be considered a threat (Hornsey, 2008; Van Knippenberg et al., 2004). Therefore, strong faultlines may produce highly cohesive subgroups that polarize the team and inhibit cross-subgroup coordination and information exchange (Lau & Murnighan, 1998; Mäs et al., 2013; Van Knippenberg et al., 2004).

Although interrelated, faultlines and diversity capture different concepts. The faultline perspective helps in understanding teams' dynamics by focusing on the social interaction across in-subgroup and out-subgroup team members, categorized according to different attributes, mainly pointing to the negative outcomes of this social categorization (van Knippenberg & Schippers, 2007). Conversely, the diversity perspective considers the degree to which team members vary according to one (or more than one) classifying attribute. As such, it overlooks the structural alignment among these attributes and mostly emphasizes the superior knowledge and information elaboration abilities of the whole team that fosters higher levels of group performance (Qi et al., 2022; Van Knippenberg et al., 2004). The existence of faultlines requires diversity because subgroups cannot emerge if the team is highly homogeneous. However, faultlines are likely to appear in groups with moderate diversity and may not arise in diverse teams because individuals' attributes may not align to create subgroups (Lau & Murnighan, 1998).[1]

By assessing how the alignment of multiple attributes influences in-workgroup interactions (Bezrukova et al., 2009; Thatcher et al., 2003), faultlines enable researchers to study how the structure of diversity affects subgroups dynamics and the overall team outcomes (Molleman, 2005). Thus, faultlines provide a nuanced understanding of the effect of board composition on corporate decisions, including those related to PESs.

2.2 | Board demographic faultlines and PES

Faultlines have been insightful in exploring the dynamics of top corporate decision-making groups, such as boards of directors and top management teams (TMTs) (Kaczmarek et al., 2012a; Richard et al., 2019; Tuggle et al., 2010). Depending on the type of attributes that align, two different faultlines may emerge. Demographic faultlines divide the team into subgroups based on the alignment of highly visible demographic attributes (Bezrukova et al., 2009), especially in the initial stages of group formation (Hutzschenreuter & Horstkotte, 2013; Lau & Murnighan, 1998, 2005). By contrast, task-related faultlines, also known as informational or knowledge-based faultlines (Georgakakis et al., 2017; Hutzschenreuter & Horstkotte, 2013; Kaczmarek et al., 2012a), split a team into subgroups based on the alignment of job-related attributes (Bezrukova et al., 2009).

The influence of faultlines on inter-subgroup interaction and team performance depends on the type of decision and the context in which it is taken because certain situations are more likely to activate faultline effects than others (Lau & Murnighan, 1998). We focus on demographic faultlines because demographic attributes are the most salient observable attributes among individuals (Leicht-Deobald et al., 2021) with strong team-splitting power (Wu et al., 2021). For instance, while gender provides a strong basis for stereotyping based on interpersonal characteristics, age accounts for different stages of life development and achievement for social comparison (Qi et al., 2022). Moreover, gender and age are the most relevant demographic attributes influencing environmental outcomes, particularly PES (Kumar & Paraskevas, 2018), because they are related to different social and environmental values and awareness (Byron & Post, 2016; Endrikat et al., 2021; Hafsi & Turgut, 2013; Ludwig & Sassen, 2022; Post et al., 2011). Thus, we conceptualize board demographic faultlines along gender and age attributes, which are also subject to greater attention by regulators and policy-makers as shown by the inclusion of mandated or recommended gender quotas (Kaczmarek et al., 2012b), as well as by changes in the UK regulation addressing directors' age (Khroud, 2007). By contrast, task-related characteristics, such as independence and experience, are less salient and more similarly distributed among boards of directors across firms in contexts characterized by high compliance with corporate governance best practices, such as the United Kingdom. Therefore, the primary source of board faultlines when deciding to implement PESs is related to the structure of demographic attributes in the team.

Prior literature analyzing gender and age as team splitting attributes finds that faultlines are detrimental to board performance (Vandebeek et al., 2016; Veltrop et al., 2015), especially for the board service role (Crucke & Knockaert, 2016). They also negatively affect firm performance, CEO turnover-performance sensitivity, and CEO compensation (Van Peteghem et al., 2018). Some recent studies highlight that gender and/or age demographic faultlines negatively affect strategic change (Richard et al., 2019; Wu et al., 2021) and general innovation (Leicht-Deobald et al., 2021), although they fail to report a significant influence on adopting green technology innovation (Ma et al., 2021).

Moreover, this literature mostly neglects the influence of the subgroups' configurational properties (e.g., power imbalance and status inequality) and the salient features of the context in which the board decision has to be taken (Qi et al., 2022).

PESs have unique characteristics that differentiate them from general innovation strategies. They involve management commitment and effectiveness in supporting R&D and commercializing sustainable products (Martinez-del-Rio et al., 2015) to create new market opportunities and improve organizational performance (Berry & Rondinelli, 1998). However, their innovative nature makes them risky and less profitable than general innovation because their returns are uncertain (Russo & Fouts, 1997; Sharma, 2000) and can occur over a longer period (Oh et al., 2016).

Due to the complexity of their evaluation, PESs must result from an open and fruitful board reflection in which directors process all relevant information to assess the different innovative solutions available (Sharma, 2000) and critically evaluate and discuss the potential uncertain scenarios stemming from their implementation. These strategies are long-term-oriented (Aragón-Correa & Sharma, 2003) and require a high level of coordination and cooperation among different departments to seize opportunities and materialize competitive advantages (Aragón-Correa, 1998; Russo & Fouts, 1997).[2] In this regard, a "shared vision" to communicate objectives within the organization is essential for effective PESs (Alt et al., 2015). Specifically, PESs require consensus from top strategic decision-making bodies that translate related gains and losses comprehensibly to other executives (Kumar & Paraskevas, 2018). Therefore, the board should be able to communicate a common view on how the firm should operate.

The presence of strong demographic faultlines within a board might have a detrimental effect on the overall board functioning and outcomes (Vandebeek et al., 2021). When the structural alignment of highly detectable and salient directors' attributes (i.e., age and gender) splits the group into polarized subgroups characterized by high within-category similarity and high between-category differences, the resulting demographic faultlines might create negative social interactions and affective conflict (Pelled, 1996) that obstruct teamwork (Meyer et al., 2014; Su et al., 2022; Van Knippenberg et al., 2004). As predicted by social identity theory, the categorization of individuals into the same subgroup (as driven by their age and gender similarity) provides them with a basis for self-identification to develop a sense about who they are (Tajfel & Turner, 1986). Thus, board members tend to identify more into their subgroups than in the whole team. At the same time, they will perceive a high psychological distance with other subgroups in line with distance theories (Jetten et al., 2004). The "we-them" distinction that arises from this fragmentation fosters in-group favoritism and outgroup discrimination, which inhibit collaboration and information processing across subgroups (Van Knippenberg et al., 2004). Therefore, the marked demographic faultline split decreases the overall level of team cohesion and social integration (Lau & Murnighan, 1998) and hampers the outcomes of the board-level effort (Crucke & Knockaert, 2016; Van Peteghem et al., 2018). Notably, the negative influence of demographic faultlines on board effectiveness is more likely to be leveraged in contexts in which ex-ante-defined factions represent particular interests within the boardroom (Veltrop et al., 2015). However, their adverse effects have also been documented in settings where boards are not subject to factional subgroups and faultlines are stable over time. Vandebeek et al. (2021) found that board faultlines are negatively related to the dismissal of poorly performing CEO in Belgian firms. Tuggle et al. (2010) reported that faultlines reduce the time boards dedicate to discussing entrepreneurial issues. Demographic faultlines constrain individuals' willingness to share their ideas with other subgroups' members (Su et al., 2022) and the team's capacity to generate novelties (Pearsall et al., 2008).

The effect of faultlines is expected to remain dormant until specific situations make individuals perceive the existence of subgroups (Carton & Cummings, 2012; Lau & Murnighan, 1998). Certain decisions can trigger subgrouping because their evaluation may indicate differences between team members based on how their attributes align (Barroso-Castro et al., 2022). Notably, the negative influence of demographic faultlines is more likely to be leveraged in situations in which individual values are relevant to the team's discussion (Chrobot-Mason et al., 2009). Demographic attributes account for directors' different values and views on adopting sustainability actions. Consequently, although demographic faultlines may be stable, the debate about PES could have a negative effect on board information processing and collaborative exchange, curtailing the openness of the discussion to appreciate the opportunities of PESs and undermining the shared vision required for their implementation. We formulate the following hypothesis:

> **Hypothesis 1.** Board demographic faultlines are negatively associated with PESs.

2.3 | The role of internal factors: the CEO's and chair's position relative to faultlines

From the faultline perspective, the relationship between board characteristics and outcomes depends on the alignment between director attributes in different subgroups, which might have a larger impact on group performance in some groups than in others. When faultline splits the board into subgroups with different status and power, the nature of the social interaction among subgroups and the likelihood of its members voicing their opinions may affect the board dynamics and outcomes differently (Carton & Cummings, 2013; Crucke & Knockaert, 2016). Accordingly, within the current faultline theorization, there is growing research on the configurational properties of subgroups (Qi et al., 2022). Group leadership is one significant but underinvestigated configurational property that might act as a moderator of the relationship between faultlines and team outcomes (Thatcher & Patel, 2012). The position of the leader relative to the faultline configuration affects the level of conflict and distribution of power among subgroups (Li & Liu, 2022; Meyer et al., 2015). The United Kingdom represents an interesting case to analyze the influence of group leadership in the board of directors' faultline configuration and the related decision-making dynamics. UK corporate boards are characterized by a "dual leadership" structure (McNulty et al., 2011) with the CEO being a different individual than the Chairperson (Financial Reporting Council, 2018). The UK Corporate Governance Code requires the Chair to be independent on appointment, which to a certain extent guarantees that the Chair, as board leader, is impartial and facilitates board discussion. Although the CEO is the most relevant entrepreneurial leader to address decisions related to new market or product innovation (Morais et al., 2020), the Chairperson affects boardroom dynamics beyond her formal leadership (Bezemer et al., 2018). The Chair is considered the firm's governance leader that guides the board decisions and exerts a significant influence on firm performance (Krause et al., 2019). Especially in times of increasing pressure on accountability and sustainability issues, the Chair is expected to effectively lead the communication with the CEO and the TMT to ensure that the company's strategic agenda is correctly executed and addresses concerns of internal and external stakeholders (Banerjee et al., 2020).

The presence of these two leaders on the board may affect the faultline configuration resulting in a status difference of subgroups that influences board dynamics around PES (Li & Liu, 2022; Meyer et al., 2015). Notably, in presence of this dual leadership structure, two possible scenarios can arise. In the first scenario, the faultlines divide the board into subgroups and both the CEO and Chair belong to the same subgroup. As a result of their social categorization in the same subgroup, the CEO and Chair will develop a shared identity and similar perspectives around resource allocation (Tajfel & Turner, 1986). Moreover, they are more likely to share information and resources with directors who are socially similar to them. The cohorts of the CEO-Chair subgroup will further remark their psychological alignment with the two most powerful leaders and highlight their distance with the other subgroups (Jetten et al., 2004). Thus, the CEO-Chair position according to the faultline subgroup configuration fosters an unbalanced distribution of power and resources among subgroups that allow the opinions from the CEO-Chair subgroup to become expression of the overall board view and to be more easily incorporated into the dominant managerial perspective. Members of the other subgroups will have less opportunities to express their voice regarding alternative views for resource allocation as they are more likely to experience more opinion suppression than the members of more powerful subgroups (Li & Liu, 2022). In this subgroup configuration, the presence of a subgroup with strong social power ensures an easily consensus building around the dominant logic (which is the common view of the CEO and Chair) and keeps the level of inter-subgroup conflicts stemming from demographic faultlines at minimum, attenuating their negative effect on PES.

In the second scenario, faultlines split the board into subgroups with the CEO and Chair belonging to two different subgroups. Having the two leaders in different subgroups will further undermine the board discussion around PES through the division of boards into two strong but highly socially distanced subgroups, both with similar power and status. As optimal distinctiveness and distance theories suggest, the categorization of the CEO and the Chair in different subgroups will provide the basis for their self-distancing and the development of opposing perspectives around resource allocation to PES. The cohorts of both subgroups will be equally willing to voice their conflicting opinions in presence of a leader that empowers them (Gibson & Vermeulen, 2003). As a result of this subgroups' configuration, the level of the CEO's and the Chair's subgroups conflicts will be higher and the degree of collaboration and communication between the two polarized subgroups will be minimal, exacerbating the negative effect of faultlines on PESs.

To summarize, we maintain that when the faultlines split creates one resourceful and powerful subgroup that combines the CEO's entrepreneurial leadership (Morais et al., 2020) with the Chair's governance leadership, this subgroup can overcome the resistance from the other subgroups. The board dominant logic will be successfully communicated through the organization, thus compensating faultlines' negative subgroup dynamics, thereby facilitating the execution of the whole board's shared strategic direction on PES.

Consequently, we expect that the CEO-Chair membership to the same subgroup positively moderates the negative relationship between demographic faultlines and PESs.

> **Hypothesis 2.** The presence of CEO and Chair in the same subgroup attenuates the negative association between board demographic faultlines and PESs.

2.4 | The role of external factors: the financial materiality of the environment

Prior literature posits that the external context affects how board composition and structure contribute to strategic outcomes (Joshi & Roh, 2009; Richard et al., 2019) because they can directly shape firms' ability to develop environmental strategies (Chen et al., 2017; García-Sánchez, 2020; García-Sánchez & Martínez-Ferrero, 2019; Martinez-del-Rio et al., 2015). However, these factors may also have an indirect impact on corporate decisions and performance by influencing managerial discretion (Wangrow et al., 2015), team members' interactions, and information sharing (Cannella et al., 2009; Cooper et al., 2014).

Due to this indirect effect of the external context on internal workgroup dynamics, prior research has explored the moderating role of three relevant external factors, that is, dynamism, complexity, and munificence (Dess & Beard, 1984; Rosenbusch et al., 2013) on the relationship between faultlines in top corporate decision-making groups and organizational outcomes. For instance, Cooper et al. (2014) found that dynamism negatively moderates the association between faultlines in TMTs and corporate financial performance because dynamic environments pose a threat to subgroups and hinder the exchange of information. By contrast, the relationship between faultlines and performance becomes positive in high complexity and munificence contexts. They maintain that complex contexts demand higher levels of group-level cognition, enhancing the advantages of information sharing among subgroups. In high-munificence situations, faultlines can be linked to the effective identification and absorption of resources and, if munificence is low, faultlines are likely to escalate conflicts and hinder group collaboration. Richard et al. (2019) investigated how dynamism shapes the connection between TMT faultlines and strategic change. In contrast to Cooper et al. (2014), their results show that the more dynamic the context, the more positive (less negative) the relationship between the two, as dynamic contexts foster information sharing across subgroups to obtain greater competitive advantages. Similarly, Wu et al. (2021) reported that board gender faultlines positively influence strategic changes in dynamic, complex, and munificent contexts. This stream of research highlights the importance of studying the role of the external context in disentangling the effect of faultlines on organizational outcomes.

As the planetary crisis unfolds, the connection between businesses and nature is intensifying, and the growing relevance of dependencies and externalities must be embedded into corporate strategies (O'Dwyer & Unerman, 2020; Unerman et al., 2018). We posit that the financial materiality of the natural environment is a relevant external factor that can exert a substantial moderating influence on the relationship between board faultlines and the implementation of PESs. As recognized by the accounting literature, the financial materiality of the natural environment refers to the possibility that certain ecological and planetary aspects can significantly impact corporations' financial performance, requiring companies to measure and manage them (Grewal & Serafeim, 2020). These aspects can affect financial performance in two ways. On the one hand, there are risks and opportunities stemming from certain environmental matters that can have a direct, strategic, financial, or economic impact on the business in the short to medium-long term (i.e., “dependencies”; O'Dwyer & Unerman, 2020). On the other hand, firms generate environmental externalities borne by other constituencies that may not directly affect their financial position (at least in the short term) but may have significant economic impacts in the long term if companies overlook or fail to adequately manage them in the present (Unerman et al., 2018).

Financially material environmental issues are industry-specific, as illustrated by the Sustainability Accounting Standards Board's classification (Khan et al., 2016), shaping competitive dynamics within an industry. In this respect, Grewal et al. (2021) found that financial markets value the consideration and disclosure of environmental aspects in industries where these aspects are financially material. The adoption of PESs can help companies manage financially material environmental aspects and exploit benefits in the business context in which they operate. Manikas et al. (2021) show that firms from industries where environmental issues are financially material are more likely to invest in activities to protect the natural environment, such as capacity leanness and property, plant, and equipment newness, resulting in higher financial performance. Additionally, the fact that certain environmental issues are not financially material in the present but may become so in the future provides them with a dynamic nature (World Economic Forum, 2020) that requires companies to adopt a proactive and timely strategy to manage them effectively before risks materialize (Grant & Wunder, 2021). Therefore, in industries where the natural environment is financially material, polarized boards are more likely to overcome the disruptive effect of demographic faultlines on coordination and information processing among subgroups, reducing their psychological distance and fostering the shared vision needed to implement innovative environmental strategies as they are more aware of the importance of proactively manage environmental issues in the long term.

Consequently, we hypothesize that the financial materiality of the natural environment positively moderates the relationship between demographic faultlines and PESs:

> **Hypothesis 3.** The financial materiality of the natural environment attenuates the negative association between board demographic faultlines and PESs.

Figure 1 presents the hypotheses graphically. The plain and dotted circles and squares represent directors according to gender and age. The distance between subgroups represents the strength of the demographic faultlines generated by the alignment of these attributes, indicating the degree of subgroup interaction and information processing that influence the adoption of PES (panel A). The presence of the CEO and Chair in the same subgroup (panel B) and the financial materiality of the natural environment (panel C) positively moderates the negative relationship between demographic faultlines and PES by fostering the interaction and information sharing between subgroups, as indicated by their closeness compared with panel A.

3 | EMPIRICAL DESIGN

3.1 | Sample and data

Our sample comprises UK firms for the period 2011–2017. The United Kingdom represents an ideal setting for investigating the role of board faultlines for PES for several reasons. First, several international organizations emphasize that boards should anticipate the harmful effects of corporate actions on society (Mallin et al., 2013). This task is especially relevant in the United Kingdom, where article 172 of the Companies Act (2006) states that directors must consider, among other issues, “(…) (d) the impact of the company's operations on the community and the environment (…)” to promote the success of corporations. This requirement does not imply that environmental innovation is mandatory. Instead, it suggests that boards of directors are likely to discuss how the business impacts the environment and what market opportunities may arise from innovative solutions enhancing the sustainability of products and processes. Second, firms in the United Kingdom must comply with the UK Corporate Governance Code, which implies that other corporate governance arrangements are similar across firms during the period analyzed. Third, the UK Corporate Governance Code encourages board diversity, indirectly implying a reasonable degree of variation in board demographics and, therefore, heterogeneity in our measures of demographic faultlines.

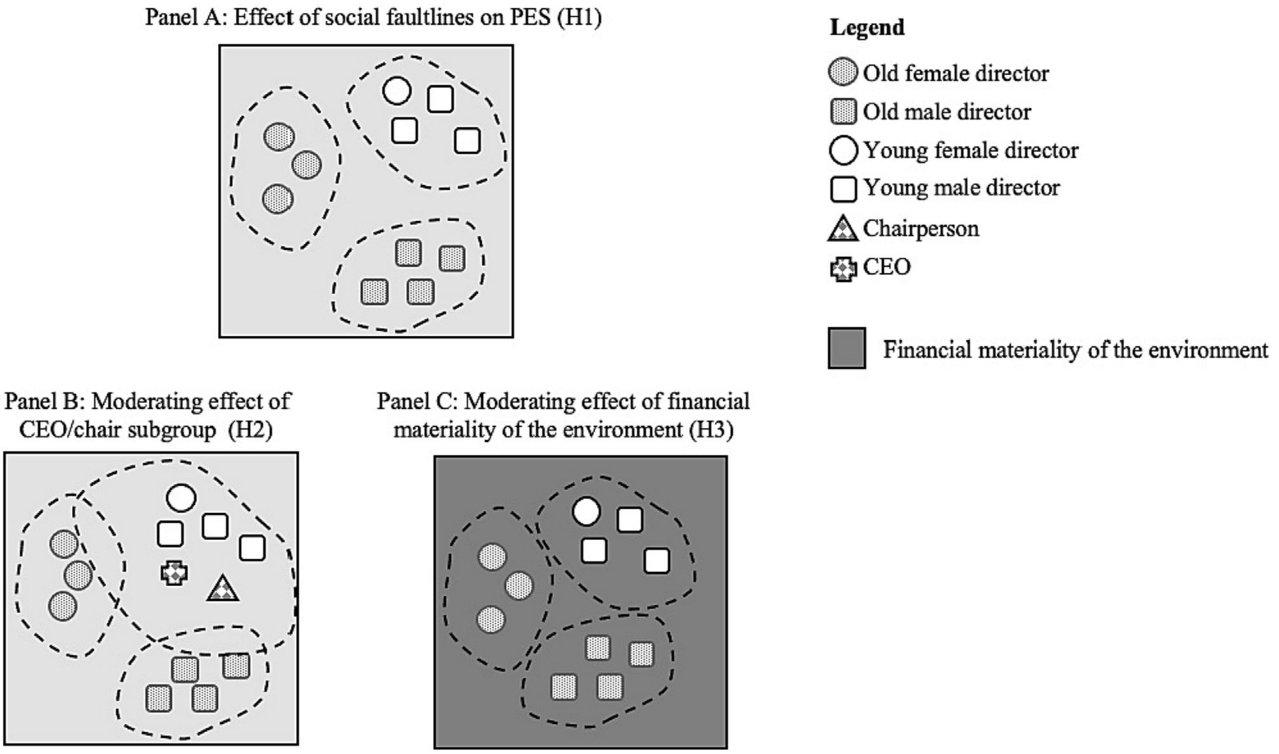

FIGURE 1 This figure graphically represents our research hypotheses. The panels show how demographic faultlines split the board of directors and its effect on PES for each hypothesis. For the purpose of this illustration, the board is characterized by the emergence of three psychological subgroups with a different combination of directors' age and gender, as represented by the dotted and plain circles and squares. The distance between subgroups represents the strength of the demographic faultlines generated by the alignment of these attributes, indicating the degree of subgroup interaction and information processing. Panel A illustrates that demographic faultlines split the board into three polarized subgroups with a low level of interaction and information processing, giving rise to the negative relationship between demographic faultlines and PES (Hypothesis 1). Panel B illustrates the positive moderating effect of the CEO-chair belonging to the same subgroup on the relationship between demographic faultlines and PES (Hypothesis 2). Panel C depicts the positive moderating role of the financial materiality of the natural environment (as indicated in the shadow in the background) that ameliorates the subgroup interaction and information processing, thus reducing the negative effect of faultlines (Hypothesis 3).

We collect data from three sources: (1) BoardEx for data on boards of directors, (2) Compustat for financial data, and (3) the Eikon database provided by Refinitiv for data on environmental strategies and CSR-related topics. We start from the entire population of UK firms available on BoardEx for the period 2010–2017[3], which amounted to 11,707 firm-year observations for 2083 unique firms. We retrieve variables on the board of directors' characteristics required for the faultline computation of 11,619 firm-year observations for 2070 unique firms. After merging BoardEx with the Compustat and Eikon datasets, our sample reduces to 8195 firm-year observations. Following Van Peteghem et al. (2018), we delete firm-year observations with a board size of less than three, as subgroup formation is unlikely in these boards. The working dataset is further reduced as we exclude observations with missing data for our variables of interest and the lagging of the independent variables. The final sample comprises 1322 observations corresponding to 269 unique firms. Table 1 presents the year distribution of observations for the final sample. The number of observations steadily grows over time but is fairly balanced across years.

TABLE 1 Sample distribution.

Year	Freq.	Percent	Cum.
2011	169	12.78	12.78
2012	171	12.93	25.72
2013	178	13.46	39.18
2014	186	14.07	53.25
2015	195	14.75	68.00
2016	202	15.28	83.28
2017	221	16.72	100.00
Total	1322	100.00	

3.2 | Variables

3.2.1 | Proactive environmental strategies

PES is the dependent variable. Ortiz-de-Mandojana et al. (2012) assessed PESs in electric companies by considering investments in renewable energy generation. However, according to Sharma (2000) and Aragón-Correa and Sharma (2003), PESs also involve establishing alternative and innovative processes and products as a voluntary approach to reduce firms' negative environmental impacts. We rely on this broader conceptualization of PESs and use the Eikon environmental innovation score as a proxy for firms' PESs. The Eikon database, formerly known as ASSET4, has been widely used in CSR research (Arena et al., 2018; Cheng et al., 2014; Shaukat et al., 2016). The data on environmental strategies are summarized into three pillar scores: "emission reduction," "resource reduction," and "environmental innovation." We choose the Eikon environmental innovation score[4] as our proxy for PES because it evaluates "a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes, or ecodesigned products" (Refinitiv, 2020, p. 22). Specifically, the score combines data on environmental product innovation, green revenue, R&D, and capex. For example, Rolls-Royce Holdings PLC (PES = 98.59), a firm that produces power systems for aviation and other industries, has established a strategy to develop innovative technologies to offer clean and safe products. The company has invested approximately two-thirds of its R&D budget yearly (1.3 billion pounds in 2016) in creating new growth opportunities by producing more sustainable engines. The company designed the most advanced scientific maritime vessels for the United Kingdom's future polar research ship. The vessel runs on low-sulfur fuel and is supported by an electrical system to reduce its consumption, emissions, noise, and vibration, thus minimizing the impact on the polar environment. Another example is the Marks & Spencer Group PLC (PES = 97.37). In 2010, it established its "Farming for the Future" program, which funds different farming initiatives in the United Kingdom to manage the impact of food production on the environment and offer products that meet the expectations of its clients.

3.2.2 | Board demographic faultlines

We measure demographic faultlines relying on two relevant demographic attributes of directors—that is, age and gender for at least three reasons: First, according to prior literature, they are the most salient in explaining firms' CSR, and particularly environmental outcomes (Kumar & Paraskevas, 2018). Second, the UK Corporate Governance Code recommends gender diversity in the boardroom (Farooq et al., 2023). Third, while in the United Kingdom, female directors tend to be younger than male directors (Vinnicombe et al., 2017), there has been a rise in the average age of board members in this country in recent years (Financial Times, 2017). Therefore, analyzing the influence of the structure of board diversity resulting from the alignment between these two demographics on board outcomes concerning environmental issues becomes highly relevant.

Different methods are available to operationalize and measure faultlines. Meyer et al. (2014) reviewed and compared the consistency and adequacy of the computational techniques and produced a decision tree (p. 654) that helps researchers select the most appropriate method based on the characteristics of their data. Based on this tree, we select the average silhouette width (ASW) to compute the faultlines (see Appendix A for more information on the ASW method).

Although some scholars constructed different faultline variables to distinguish demographic and task-related characteristics (Georgakakis et al., 2017; Kaczmarek et al., 2012a; Thatcher & Patel, 2012), we follow prior studies that computed faultlines based on demographic variables (Leicht-Deobald et al., 2021; Qi et al., 2022; Richard et al., 2019) and specifically consider directors' age and gender. We measure gender by creating a dichotomous variable that takes the value of 1 when the director is female and 0 otherwise, and we compute age as a continuous variable (number of years). One issue to consider when computing faultlines is the weighting of the attributes. This issue is critical when using both categorical and numerical attributes. Most researchers address this issue by dividing numerical attributes by their standard deviation (Bezrukova et al., 2009; Meyer & Glenz, 2013). However, this procedure causes numerical variables to dominate the clustering solution and affects the configuration of the subgroups. We follow Van Peteghem et al. (2018) to solve this problem and rescale age by range rather than standard deviation before computing the ASW. Thus, all attributes have the same weight, with a range of 1.

3.2.3 | Moderating variables: internal and external factors

To test Hypothesis 2 on the moderating effect of the presence of the Chair and CEO in the same subgroup as a result of the faultline split, we created a binary variable (*CHAIR_CEO_SUBG*) that takes the value of 1 if the Chair and CEO belong to the same subgroup because of demographic faultline splits and 0 otherwise.

Regarding Hypothesis 3 on the moderating effect of external factors, we capture the extent to which environmental issues are financially material in the industry (*ENV_MATERIALITY*) through a binary variable that equals 1 if the firm belongs to an industries that are more exposed to the environmental impact of their business activities (Cho & Patten, 2007; Cormier & Magnan, 2015), for example, oil and gas, chemicals, paper and pulp, mining and steel-making, and 0 otherwise.

3.2.4 | Control variables

Aligned with prior studies on board faultlines (Bezrukova et al., 2009; Meyer et al., 2015), we include several control variables at the board, company, and market levels. Table 2 provides the list of control variables and how they are measured.

3.3 | Data analysis

We employ a multilevel regression analysis technique because our observations are nested within industries and crossed between years.

TABLE 2 Variable definition.

Variable	Definition
Dependent variable	
Proactive environmental strategies (*PES*)	Refinitiv Eikon environmental innovation score
Independent variable	
Board demographic faultlines (*B_FAU*)	Average silhouette width (ASW) considering directors' age and gender
Moderating variables	
CEO and Chair membership to the same subgroup (*CHAIR_CEO_SUBG*)	Dichotomous variable that takes the value of 1 if the chair and CEO belong to the same subgroup because of demographic faultline splits; and 0 otherwise.
Financial materiality of the environment in the industry (*ENV_MATERIALITY*)	Dichotomous variable that equals 1 if the firm belongs to one of the following industries: energy, materials, utility, industrial.
Control variables	
CEO woman (*CEO_WOMEN*)	Dichotomous variable that takes the value 1 if the CEO is female, and 0 otherwise.
CEO age (*CEO_AGE*)	The age of the CEO
Chairwoman (*CHAIR_WOMEN*)	Dichotomous variable that takes the value 1 if the Chair is female, and 0 otherwise.
Chair age (CHAIR AGE)	The age of the Chair
CEO tenure (*CEO_TENURE*)	The years in role of the CEO
CEO education (*CEO_EDUCATION*)	The educational level of the CEO
Board diversity in age (*AGE_DIV*)	The coefficient of variation of directors' age
Board diversity in gender (*GENDER_DIV*)	Blau index based on directors' gender
Board diversity in international experience (*EXP_DIV*)	Blau index based on director's international experience
Board diversity in tenure (*TENURE_DIV*)	The coefficient of variation of directors' tenure
Board diversity in independence (*INDEP_DIV*)	Blau index based on directors' independence
Number of subgroups (*N_FAUGROUP*)	The number of subgroups crated by faultlines
Busy board (*B_BUSY*)	The average number of directorships in other firms held by directors of the focal company
Directors' overlap (*D_OVERLAP*)	Overlap of directors' board tenure
CSR committee (*CSR_COMM*)	Dichotomous variable that takes the value 1 if there is a CSR-related committee on the board, and 0 otherwise.
Board size (*B_SIZE*)	Number of directors that are seated on the board
Leverage (*LEV*)	End of year total liabilities divided by end of year equity book value
Profitability (*ROA*)	End of year operating income divided by the average value of beginning and end of year total asset
Firms size (*SIZE*)	Natural logarithm of end of year total asset
Capital intensity (*CAPEX*)	Industry-based capital intensity (capital expenditures/total sales)
Environmental dynamism (*ENV_DYNAMISM*)	Dichotomous variable that equals 1 if the firm belongs to an industry with the level of dynamism above the sample mean; 0 otherwise. Dynamisms is proxied by the instability of industry sales estimated in two steps. First, we regress the natural logarithm of total sales in an industry using a year-index variable as the independent variable. Second, we calculate the antilog of the standard error of the slope regression coefficient to capture the instability in industry sales.
Environmental complexity (*ENV_COMPLEXITY*)	Dichotomous variable that equals 1 if the firm belongs to an industry with the level of complexity above the sample mean; 0 otherwise. Complexity is measured by the percentage of sales of the four firms with the highest sales in each one-digit SIC code industry, respect to the total sales of the industry.
Environmental munificence (*ENV_MUNIFICENCE*)	Dichotomous variable that equals 1 if the firm belongs to an industry with the level of munificence above the sample mean; 0 otherwise. Munificence is estimated by the 5-year average growth of sales in each one-digit SIC industry.
CO_2 emission (*CO2*)	Total CO_2 emission to revenues

This methodology leads to more efficient estimations than an ordinary least squares (OLS) regression in testing cross-level hypotheses such as Hypothesis 3, where industry-level factors interact with firm-level characteristics (Tom et al., 1999). Following prior studies (Piaskowska & Trojanowski, 2014), our models encompass random effects for each level of analysis and employ independent and control variables lagged by 1 year to alleviate reverse causation and endogenous variable concerns.

We base our analysis on the following multilevel regression model:

$$\mathrm{PES_{it}} = \beta_0 + \beta_1\,\mathrm{B\_FAU}_{i(t-1)} + \sum\nolimits_j \left(\beta_j\,\mathrm{CONTROLS}_{j,i(t-1)}\right) + \varepsilon \tag{1}$$

where *PES* captures firm *i*'s PESs at time *t*; *B_FAU* captures the strength of demographic faultlines in time $t-1$; and *CONTROLS* is the vector of control variables at the board, firm, and industry levels in times $t-1$, as defined in Table 2.

We expect our coefficient β_1 to be negative and statistically significant to support Hypothesis 1. Then, we augment Equation (1) and run a moderation analysis to test Hypothesis 2 (Equation 2) and Hypothesis 3 (Equation 3):

$$\mathrm{PES_{it}} = \beta_0 + \beta_1\,\mathrm{B\_FAU}_{i(t-1)} + \beta_2\,\mathrm{B\_FAU}_{i(t-1)} * \mathrm{CHAIR\_CEO\_SUBG}_{i(t-1)} + \sum\nolimits_j \left(\beta_j\,\mathrm{CONTROLS}_{j,i(t-1)}\right) + \varepsilon \tag{2}$$

$$\mathrm{PES_{it}} = \beta_0 + \beta_1\,\mathrm{B\_FAU}_{i(t-1)} + \beta_2\,\mathrm{B\_FAU}_{i(t-1)} * \mathrm{ENV\_MATERIALITY}_{i(t-1)} + \sum\nolimits_j \left(\beta_j\,\mathrm{CONTROLS}_{j,i(t-1)}\right) + \varepsilon \tag{3}$$

4 | RESULTS

4.1 | Descriptive results

Table 3 presents the means, standard deviations, and correlation matrix of the variables used in the analysis. The average level of board demographic faultlines (*B_FAU*) is relatively high (0.639), with the average board showing few (between 2 and 3) but very polarized subgroups. Faultlines split the board in subgroup configuration characterized by the membership of the CEO and the Chair to the same subgroup (*CHAIR_CEO_SUBG*) in less than 45% of the sample companies, meaning that the structure of the demographic diversity attributes leads to a social similarity of the two leaders relative to the other subgroup in 590 cases. Overall, firms operate in a task environment characterized by high financial materiality of the natural environment (*ENV_MATERIALITY* = 0.729). The mean level of PESs is 57.088, indicating a moderate propensity of the sample firms to harness new opportunities.[5]

4.2 | Main analysis

Table 4 shows the statistical estimates of the multilevel regression model to evaluate the effect of board demographic faultlines on PESs in different task environments.

Model [1] reports the analysis based on Equation (1) to assess the main effect of the faultline on PES. The faultline coefficient is statistically significant and negatively related to PESs (*B_FAU* = −12.37, $p < 0.05$). This result supports Hypothesis 1, suggesting that when considering strategic decisions that are actively debated with divergent perspectives among directors, such as PES, the alignment of gender and age creates strong demographic faultlines (e.g., all young female vs. all old male directors). In this situation, directors with different values and perspectives regarding sustainability strategies are polarized in highly distanced subgroups suffering from in-group-out-group bias. This *structure* of board demographic diversity exerts a detrimental effect on its functioning as it limits the exchange of information between few polarized and highly cohesive subgroups and inhibits the integration of diverse subgroup perspectives into the board decision-making process. Consequently, firms are less likely to engage in PES because the directors' ability to critically evaluate the opportunities stemming from PESs and agree on their implementation at the board level is undermined. Interestingly, none of the demographic attributes of CEO and chair is significantly associated with PES, if taken in isolation. What is more when considering demographic faultlines, board age diversity (*AGE_DIV*) is positively and significantly related to PES, while gender diversity (*GENDER_DIV*) does not significantly affect PES, supporting the idea that demographic faultlines are distinct and finer constructs for capturing the alignment of demographic attributes within and between the board subgroups compared with the director's classification in different categories of age and gender (Thatcher & Patel, 2012). Conversely, the diversity in tenure (*TENURE_DIV* = −8.005, $p < 0.01$) is negatively and statistically significantly related to PESs, suggesting that heterogeneity in directors' tenure on the board is a source of conflict when discussing proactive engagement in new, innovative, environmentally friendly solutions. Among the other control variables, the coefficient on multiple directorships (*B_BUSY* = −1.237, $p < 0.01$) is negatively and significantly related to PESs. In contrast, the presence of a committee specifically related to sustainability decisions (*CSR_COMM* = −3.316, $p < 0.05$) is negative and significantly related to PESs. Finally, firm size and *CO2* are statistically significant and positively related to PESs, suggesting that larger firms and firms with and firms with higher level of CO_2 emission are more likely to engage in PESs.

In Model [2], we run Equation (3) to test the moderating effect of the presence of Chair and CEO in the same subgroup on the relationship between *B_FAU* and PESs. As in Model [1], the coefficient of demographic faultline (*B_FAU* = −26.31, $p < 0.01$) is negative and significant, yet we find that this negative relationship between board demographic faultlines and PESs is attenuated when the CEO and Chair belong to the same subgroup (*B_FAU* * *CHAIR_CEO_SUBG* = 41.79, $p < 0.01$), supporting Hypothesis 2. This result suggests that the social similarity between the CEO and Chair creates a strong and highly cohesive subgroup that prevails over the others, reducing intragroup bias and increasing the board's ability to harness new opportunities concerning the natural environment.

In Model [3], we run Equation (3) to test the moderating effect of the financial materiality of the natural environment on the relationship between demographic faultlines and PESs. While the coefficient of board demographic faultlines (*B_FAU* = −39.25, $p < 0.01$) behaves in the same way as in Model [1], its interaction with *ENV_MATERIALITY* is positive and statistically significant (*B_FAU* * *ENV_MATERIALITY* =

TABLE 3 Descriptive statistics and correlations.

		Mean	p50	SD	1	2	3	4	5	6	7	8	9
1	*PES*	57.088	56.818	25.991	1.000								
2	*B_FAU*	0.639	0.635	0.095	−0.037	1.000							
3	*CHAIR_CEO_SUBG*	0.446	0.000	0.497	0.072**	−0.198***	1.000						
4	*ENV_MATERIALITY*	0.729	1.000	0.444	−0.183***	−0.073**	−0.081**	1.000					
5	*CEO_WOMEN*	0.050	0.000	0.219	−0.068*	0.109***	−0.194***	0.094***	1.000				
6	*CEO_AGE*	52.812	52.000	6.026	0.019	0.028	0.267***	−0.130***	−0.067*	1.000			
7	*CHAIR_WOMEN*	0.011	0.000	0.105	−0.007	0.032	−0.067*	−0.112***	0.073**	−0.006	1.000		
8	*CHAIR_AGE*	63.288	63.950	5.820	0.107***	0.043	−0.104***	−0.069*	−0.103***	0.238***	−0.131***	1.000	
9	*CEO_TENURE*	8.495	6.800	7.129	−0.029	0.023	0.155***	−0.078**	−0.105***	0.425***	0.021	0.059*	1.000
10	*CEO_EDUCATION*	3.371	3.000	1.572	0.009	0.097***	−0.000	0.006	0.064*	0.135***	−0.012	0.110***	−0.112***
11	*AGE_DIV*	0.129	0.125	0.037	−0.011	0.039	−0.085**	−0.064*	0.075**	−0.309***	−0.090**	−0.026	−0.101***
12	*GENDER_DIV*	0.242	0.277	0.150	0.099***	0.008	0.165***	−0.064*	0.183***	0.029	0.122***	0.031	−0.084**
13	*EXP_DIV*	0.369	0.420	0.147	−0.036	−0.014	0.018	−0.079**	0.087**	−0.015	0.044	−0.084**	−0.153***
14	*TENURE_DIV*	0.727	0.723	0.285	−0.040	0.005	0.045	−0.019	−0.074**	0.127***	0.002	0.011	0.364***
15	*INDEP_DIV*	0.409	0.420	0.076	−0.096***	−0.048	−0.039	−0.024	−0.052	0.006	0.019	−0.035	0.184***
16	*N_FAUGROUP*	2.663	2.000	0.794	0.055*	0.175***	−0.467***	−0.039	−0.032	0.041	0.027	0.039	−0.013
17	*B_BUSY*	3.470	3.190	1.761	−0.007	0.058*	−0.005	−0.100***	0.024	0.006	0.004	−0.048	−0.059*
18	*D_OVERLAP*	3.104	2.907	1.440	−0.047	0.070*	0.013	0.016	−0.089**	0.237***	0.003	0.070*	0.548***
19	*CSR_COMM*	0.221	0.000	0.415	0.118***	−0.057*	0.096***	0.066*	−0.040	−0.025	−0.057*	0.027	−0.082**
20	B_SIZE	7.791	7.000	1.978	0.221***	0.313***	0.158***	−0.203***	−0.016	0.161***	−0.021	0.069*	0.023
21	LEV	−1.788	1.394	90.166	−0.029	0.029	−0.041	−0.051	0.014	0.030	0.003	−0.022	−0.014
22	ROA	0.056	0.0539	0.084	−0.079**	−0.012	0.028	−0.041	−0.034	−0.035	0.068*	−0.020	0.049
23	SIZE	7.931	7.643	1.868	0.332***	0.116***	0.104***	−0.244***	0.014	0.101***	−0.045	0.116***	−0.098***
24	CAPEX	0.060	0.023	0.126	−0.114***	0.010	−0.016	0.267***	−0.001	0.059*	−0.017	−0.053	0.049
25	ENV_DYNAMISM	0.424	0.000	0.494	0.030	−0.003	−0.023	−0.291***	−0.143***	0.015	0.024	0.025	0.030
26	ENV_COMPLEXITY	0.448	0.000	0.497	0.172***	0.062*	−0.023	−0.596***	−0.111***	0.067*	0.119***	0.079**	−0.028
27	ENV_MUNIFICENCE	0.428	0.000	0.494	0.093***	−0.027	−0.023	−0.331***	−0.123***	−0.032	0.008	−0.015	0.040
28	*CO2*	0.001	0.001	0.001	0.017	−0.011	−0.011	0.155***	0.037	0.070*	−0.026	0.013	0.021

TABLE 3 (Continued)

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
10	1.000																		
11	−0.033	1.000																	
12	0.027	−0.195***	1.000																
13	0.045	−0.033	0.066*	1.000															
14	−0.029	−0.035	0.065*	−0.026	1.000														
15	−0.116***	0.102***	−0.261***	−0.005	0.056*	1.000													
16	−0.008	−0.013	0.108***	0.003	0.029	0.003	1.000												
17	0.073**	0.018	0.055*	0.017	−0.023	−0.080**	0.040	1.000											
18	−0.046	0.007	−0.256***	−0.105***	−0.073**	0.160***	−0.053	−0.027	1.000										
19	0.027	−0.054*	0.132***	−0.050	−0.069*	−0.226***	0.027	0.046	−0.076**	1.000									
20	0.108***	−0.036	0.268***	0.028	0.058*	−0.160***	0.169***	0.141***	−0.031	0.179***	1.000								
21	0.043	0.002	−0.009	−0.033	0.028	−0.009	0.026	0.005	−0.004	−0.068*	−0.018	1.000							
22	−0.102***	0.119***	−0.002	−0.046	0.061*	0.091***	−0.025	−0.030	0.046	−0.124***	−0.062*	−0.023	1.000						
23	0.088**	−0.175***	0.282***	−0.075**	−0.022	−0.323***	0.087**	0.200***	−0.095***	0.352***	0.544***	−0.002	−0.252***	1.000					
24	0.138***	−0.043	−0.083**	0.031	−0.092***	−0.020	0.004	−0.004	0.087**	0.137***	0.012	−0.029	−0.236***	0.041	1.000				
25	−0.036	−0.015	−0.038	−0.020	−0.002	0.053	0.054	0.017	0.020	−0.016	0.015	0.041	−0.032	0.100***	0.038	1.000			
26	−0.018	0.003	0.009	0.012	0.064*	0.061*	0.007	0.042	−0.051	−0.064*	0.097***	0.058*	0.024	0.211***	−0.198***	0.278***	1.000		
27	−0.014	0.065*	−0.170***	0.003	0.005	0.106***	−0.018	0.030	0.020	−0.068*	0.012	0.028	0.046	0.030	−0.026	0.185***	0.176***	1.000	
28	0.111***	−0.067*	−0.094***	−0.003	−0.027	−0.018	−0.005	−0.022	0.065*	0.151***	−0.026	0.007	−0.119***	0.004	0.520***	0.025	−0.109***	0.052	1.000

Note: Table 3 shows the descriptive statistics and the Pearson correlation matrix for all the variables. All variables are listed and defined in Table 2.
*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
***Statistically significant at the 1% level.

TABLE 4 Main results: The effects of demographic faultlines on PES in different task environments.

Variables	[1] PES	[2] PES	[3] PES
B_FAU	−12.37**	−26.31***	−39.25***
	(6.295)	(7.477)	(11.22)
*B_FAU * CHAIR_CEO_SUBG*		41.79***	
		(12.22)	
*B_FAU * ENV_MATERIALITY*			37.21***
			(12.87)
CHAIR_CEO_SUBG	1.283	−24.77***	1.494
	(1.520)	(7.768)	(1.516)
ENV_MATERIALITY	3.394	3.579	−20.67*
	(8.599)	(8.622)	(11.97)
CEO_WOMEN	−0.737	0.272	−1.017
	(2.984)	(2.985)	(2.976)
CEO_AGE	−0.109	−0.157	−0.128
	(0.122)	(0.122)	(0.122)
CHAIR_WOMEN	4.832	4.827	5.012
	(5.173)	(5.149)	(5.156)
CHAIR_AGE	−0.0489	−0.0293	−0.0405
	(0.106)	(0.105)	(0.105)
CEO_TENURE	0.146	0.149	0.178
	(0.121)	(0.121)	(0.121)
CEO_EDUCATION	−0.474	−0.569	−0.475
	(0.378)	(0.377)	(0.376)
AGE_DIV	31.28*	29.74*	30.71*
	(16.99)	(16.92)	(16.94)
GENDER_DIV	−4.370	−5.041	−4.931
	(4.420)	(4.404)	(4.410)
EXP_DIV	0.887	1.390	1.465
	(3.945)	(3.929)	(3.937)
TENURE_DIV	−8.005***	−8.054***	−8.192***
	(2.218)	(2.208)	(2.212)
INDEP_DIV	4.752	5.544	5.115
	(8.069)	(8.035)	(8.044)
N_FAUGROUP	1.374	1.446*	1.639*
	(0.840)	(0.836)	(0.842)
B_BUSY	−1.237***	−1.268***	−1.227***
	(0.317)	(0.315)	(0.316)
D_OVERLAP	−0.758	−0.680	−0.849*
	(0.507)	(0.505)	(0.506)
CSR_COMM	−3.316**	−3.188**	−3.591**
	(1.574)	(1.568)	(1.572)
B_SIZE	0.533	0.402	0.563
	(0.366)	(0.366)	(0.365)
LEV	−0.00445	−0.00506	−0.00476
	(0.00588)	(0.00586)	(0.00587)

(Continues)

TABLE 4 (Continued)

Variables	[1] PES	[2] PES	[3] PES
ROA	−4.520	−3.839	−5.535
	(6.851)	(6.822)	(6.838)
SIZE	6.768***	6.788***	6.799***
	(0.494)	(0.492)	(0.493)
CAPEX	−14.08	−13.21	−13.81
	(8.605)	(8.573)	(8.580)
ENV_DYNAMISM	−0.912	−1.005	−0.827
	(1.324)	(1.318)	(1.320)
ENV_COMPLEXITY	0.567	1.056	0.446
	(1.953)	(1.949)	(1.947)
ENV_MUNIFICENCE	1.542	1.596	1.507
	(1.292)	(1.287)	(1.288)
CO2	5992***	5908***	6043***
	(1079)	(1074)	(1076)
Constant	22.16	32.68**	39.27***
	(13.94)	(14.25)	(15.13)
Observations	1322	1322	1322
Number of groups	52	52	52

Note: Table 4 reports the results of the multilevel regression analysis testing our research hypotheses on the role of board demographic faultlines for PES. Column [1] reports results for Equation (1) to test the direct relationship between board demographic faultlines and PES (Hypothesis 1). Column [2] reports results for Equation (2) to test the moderating effect of the CEO-Chair membership to the same subgroup (Hypothesis 2). Column [3] reports results for Equation (3) to test the moderating effect of financial materiality of environmental issues (Hypothesis 3). All variables are listed and defined in Table 2. Standard errors in parentheses.
*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
***Statistically significant at the 1% level.

37.21, $p < 0.01$), supporting Hypothesis 3. This result indicates that when environmental costs emerging from firms' environmental activities are financially relevant (i.e., issues related to the natural environment affect corporate financial performance), board disagreement decreases and the importance of catching opportunities increases, and extremely polarized boards will easily reach a common-shared view around the need for PESs, thus attenuating the negative association between board demographic faultlines and PESs.

4.3 | Additional analysis and robustness checks

4.3.1 | The influence of board demographic diversity on PES

Our conceptualization relies on the notion that board faultlines captures a construct that is different from diversity, and it enables to appreciate social dynamics arising in the board decision-making as a result of board member identification and categorization in psychologically distanced subgroups. To corroborate that diversity and faultlines are capturing two different conceptual constructs, we re-run our main analysis replacing our measure of faultlines with alternative measures of board diversity. Results (Table 5) show that our main evidence of a negative association between the board of directors faultlines and proactive environmental innovation does not hold if we consider the overall board diversity (Columns [1]–[3]), or age diversity (Columns [4]–[6]) and gender diversity (Columns [7]–[9]), separately measured. Further, in the models in Columns [4]–[5], we find a positive and significant association between age and diversity on PES. This result supports the idea that diversity and faultlines are measuring distinct constructs. While the former is more related to the value-enhancing effects of appointing directors that bring a variety of views (due to their classification in a certain demographic category), the latter is more associated with the disruptive effect of having subgroups of directors that are socially distanced, hindering decision-making at the board level.

4.3.2 | The influence of FAU on RES

In this paper, we move from the assumption that the adoption of PESs is more likely to be influenced by board demographic faultlines when compared with other types of environmental strategies that involve operational decisions reflecting a defensive approach to mitigate harm and deal with the consequences arising from unmanaged environmental impacts (Kumar & Paraskevas, 2018; Martinez-del-Rio et al., 2015). In other words, boards are less involved in the formulation of reactive environmental strategies (RESs)[6] and, if involved, are more likely to agree, regardless of whether they are subject to faultlines, given the noncontroversial character of such mitigation activities.

To support this claim, we re-run our models in Table 4 by using RESs as dependent variable, measured as the level of CO_2 emissions (*CO2*). Results provided in Table 6 show that *B_FAU* is not significantly associated with RESs, suggesting that the disruptive effects of board faultlines on board decision outcome where firms proactively integrate environmental consideration in their business model, disappears when we consider alternative outcomes where firms react to changes in the contextual factor that require them to modify practices (i.e., the compliance with regulation).

5 | DISCUSSION AND IMPLICATIONS

Very little is known about how board faultlines affect sustainability decisions (Crucke & Knockaert, 2016; Vandebeek et al., 2021; Veltrop et al., 2015). Our study reveals that strong board demographic faultlines deteriorate firms' proactive environmental approaches. This knowledge has important implications for boards' diversity practices, their nominating committees, and regulatory bodies. On the one hand, corporate executives prefer hiring directors similar to themselves (Ferreira, 2015). On the other hand, companies usually search for candidates that better satisfy their needs (Vandebeek et al., 2021). Our results highlight the identification of suitable selection criteria to ensure that the new director's profile meets company requirements (including the call for greater diversity) and adequately complements the existing board diversity structure to avoid excessive board polarization and critical groupthink.

We report that strong demographic faultlines create highly cohesive but polarized subgroups that cannot cooperate and exchange the information needed to evaluate the complex and diverse benefits of PESs. This result aligns with Tuggle et al. (2010), who found that faultlines reduce the time boards dedicate to discussing entrepreneurial issues such as PESs. This result also underlines the importance of enriching board discussions around innovative environmental solutions (Ortiz-de-Mandojana et al., 2012) and the need for cooperation and a "shared vision" within boards, which are essential requirements for effectively implementing PESs (Alt et al., 2015; Aragón-Correa, 1998; Russo & Fouts, 1997).

The result of the negative association between board demographic faultlines and PESs aligns with previous studies reporting that faultlines hamper board processes and outcomes (Crucke & Knockaert, 2016; Vandebeek et al., 2021; Veltrop et al., 2015) and eventually hinder firm performance (Kaczmarek et al., 2012a). Our finding also connects with the literature on the influence of faultlines on firms' innovation processes in other corporate workgroups. While our results support studies showing that firms' workgroup faultlines hamper creativity (Qi et al., 2022), our result contradicts Ma et al.'s (2021) finding that demographic faultlines in TMTs have a nonsignificant relationship with green technology. This divergence may indicate that boards and TMTs entail different dynamics, causing faultlines to play diverse roles in corporate outcomes. In so doing, we further differentiate our approach from the studies that investigate the role of board diversity on CSR (Barroso-Castro et al., 2022; Farooq et al., 2023; Rao & Tilt, 2016) at the conceptual and operational level. At conceptual level, we go beyond the construct of board diversity as the extent of variation of one (or more) classifying attributes among board members, and look at the configurational structure resulting from the alignment of two demographic attributes (gender and age) that the literature has found as relevant in driving environmental outcomes. In contrast to diversity studies anchored in upper echelon theory that highlight the CSR performance-enhancing effect of a diverse board, we mobilize social theories to explain the mechanism through which board members' categorization and identification in different psychological subgroups give rise to the negative social interactions among board subgroups. At the operational level, we show that diversity and faultlines measures are not necessarily correlated as boards with moderate level of diversity may show high faultlines when they split into polarized subgroups that are internally homogeneous but externally "socially" distanced.

Furthermore, we leverage on this social perspective to identify what configuration of board subgrouping is more beneficial to PES as a function of the board members similarity to the "voice" of their leaders (CEO and Chair). Our evidence of the relevance of the CEO-Chair social similarity for the faultline configuration and the resulting

TABLE 5 Robustness analysis using diversity measures.

Variables	[1] DIV = GENDER&AGE DIVERSITY	[2] DIV = GENDER&AGE DIVERSITY	[3] DIV = GENDER&AGE DIVERSITY	[4] DIV = AGE DIVERSITY	[5] DIV = AGE DIVERSITY	[6] DIV = AGE DIVERSITY	[7] DIV = GENDER DIVERSITY	[8] DIV = GENDER DIVERSITY	[9] DIV = GENDER DIVERSITY
DIV	6.155	13.39	−0.307	13.60**	16.67**	18.36	−3.432	0.946	−8.516
	(6.808)	(8.622)	(13.04)	(5.428)	(7.323)	(11.45)	(4.285)	(5.284)	(7.596)
*DIV * CHAIR_CEO_SUBG*		−16.68			−6.449			−10.70	
		(12.21)			(10.31)			(7.562)	
*DIV * ENV_MATERIALITY*			8.629			−5.988			7.056
			(14.85)			(12.69)			(8.703)
CHAIR_CEO_SUBG	0.0799	6.867	0.106	0.458	4.093	0.444	0.458	3.153	0.474
	(1.215)	(5.116)	(1.216)	(1.222)	(5.937)	(1.222)	(1.222)	(2.262)	(1.222)
ENV_MATERIALITY	3.155	3.176	−0.408	3.342	3.415	6.791	3.342	3.256	1.573
	(8.537)	(8.548)	(10.51)	(8.588)	(8.590)	(11.28)	(8.588)	(8.604)	(8.853)
DEMO_DIV				−3.432	−3.430	−3.406	13.60**	13.55**	13.65**
				(4.285)	(4.285)	(4.285)	(5.428)	(5.423)	(5.427)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	17.74	15.04	20.38	11.33	9.472	8.713	11.33	10.69	12.74
	(12.72)	(12.87)	(13.51)	(12.99)	(13.32)	(14.12)	(12.99)	(13.00)	(13.10)
Observations	1322	1322	1322	1322	1322	1322	1322	1322	1322
Number of groups	52	52	52	52	52	52	52	52	52

Note: Table 5 reports the results of the multilevel regression analysis using diversity measures instead of faultlines measures. In models [1]–[3], DIV is defined as the average board diversity in terms of age and gender. In models [4]–[6], DIV is defined as the value of age diversity (AGE_DIV), calculated as the Blau index based on directors' age. In these models, we controlled for gender diversity through the DEMO_DIV that is equal to GENDER_DIV. In models [7]–[9], DIV is defined as the value of gender diversity (GENDER_DIV), calculated as the Blau index based on directors' gender. In these models, we controlled for age diversity through the variable DEMO_DIV that is equal to AGE_DIV. All other variables are listed and defined in Table 2 in the manuscript. Standard errors in parentheses.

*Statistically significant at the 10% level.

**Statistically significant at the 5% level.

***Statistically significant at the 1% level.

TABLE 6 The effect of demographic faultlines on RESs.

Variables	[1] CO_2	[2] CO_2	[3] CO_2
B_FAU	0.009	−0.072	0.184
	(0.158)	(0.188)	(0.289)
*B_FAU * CHAIR_CEO_SUBG*		0.248	
		(0.310)	
*B_FAU * ENV_MATERIALITY*			−0.235
			(0.328)
CHAIR_CEO_SUBG	0.043	−0.111	0.042
	(0.038)	(0.197)	(0.038)
ENV_MATERIALITY	0.003	0.003	0.154
	(0.059)	(0.059)	(0.219)
CEO_WOMEN	0.255***	0.260***	0.257***
	(0.071)	(0.071)	(0.071)
CEO_AGE	0.004	0.004	0.004
	(0.003)	(0.003)	(0.003)
CHAIR_WOMEN	−0.037	−0.037	−0.038
	(0.133)	(0.133)	(0.133)
CHAIR_AGE	0.005*	0.005*	0.005*
	(0.003)	(0.003)	(0.003)
CEO_TENURE	−0.0071**	−0.0071**	−0.0073**
	(0.003)	(0.003)	(0.003)
CEO_EDUCATION	0.014	0.013	0.014
	(0.009)	(0.009)	(0.009)
AGE_DIV	−0.972**	−0.981**	−0.969**
	(0.410)	(0.410)	(0.410)
GENDER_DIV	−0.271**	−0.276**	−0.268**
	(0.110)	(0.110)	(0.110)
EXP_DIV	−0.107	−0.104	−0.109
	(0.097)	(0.097)	(0.097)
TENURE_DIV	0.141**	0.140**	0.142**
	(0.055)	(0.055)	(0.055)
INDEP_DIV	−0.022	−0.018	−0.023
	(0.200)	(0.200)	(0.200)
N_FAUGROUP	0.013	0.014	0.012
	(0.021)	(0.021)	(0.021)
B_BUSY	−0.003	−0.003	−0.003
	(0.008)	(0.008)	(0.008)
D_OVERLAP	0.021*	0.022*	0.022*
	(0.012)	(0.012)	(0.012)
CSR_COMM	0.174***	0.175***	0.175***
	(0.037)	(0.037)	(0.037)
B_SIZE	−0.005	−0.006	−0.005
	(0.010)	(0.010)	(0.010)
LEV	0.002	0.001	0.001
	(0.001)	(0.001)	(0.001)
ROA	0.032	0.036	0.038
	(0.173)	(0.173)	(0.173)
SIZE	−0.018	−0.018	−0.018
	(0.011)	(0.011)	(0.011)
CAPEX	2.370***	2.376***	2.372***
	(0.151)	(0.151)	(0.150)
ENV_DYNAMISM	−0.001	−0.001	−0.001
	(0.031)	(0.031)	(0.031)
ENV_COMPLEXITY	0.025	0.027	0.026
	(0.040)	(0.040)	(0.040)
ENV_MUNIFICENCE	0.064**	0.064**	0.064**
	(0.031)	(0.031)	(0.031)
Constant	−0.366	−0.305	−0.475
	(0.272)	(0.283)	(0.311)
Observations	1322	1322	1322
Number of groups	52	52	52

Note: Table 6 reports the results of the multilevel regressions to check the robustness of the results reported in Table 4 considering RES, measured as total CO_2 emissions to revenues. Column [1] reports results for Equation (1) to test the direct relationship between board demographic faultlines and PES (Hypothesis 1). Column [2] reports results for Equation (2) to test the moderating effect of the CEO-Chair membership to the same subgroup (Hypothesis 2). Column [3] reports results for Equation (3) to test the moderating effect of financial materiality of environmental issues (Hypothesis 3). All variables are listed and defined in Table 2. Standard errors in parentheses.
*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
***Statistically significant at the 1% level.

board effective discussion around PESs highlights the substantive role of the board Chair as the leader, thereby answering recent calls for studying "how board chairs manage and lead increasingly diverse boards" (Banerjee et al., 2020, p. 393). Analyzing the extent to which board members' attributes load into a board faultline configuration that reduces the social distance between the two leaders (and their cohorts), we highlight how the interdependence between the Chair and CEO attributes translates into better-performing boards with positive implication on PESs. In this regard, our study recommends aligning the demographic attributes of the two leaders because this situation fosters consensus at the board level, which is required for PESs. A strong demographic similarity between the two leaders overcome the clash between subgroups, leading to a board environment that limits inter-subgroup bias and fosters the board's overall identity (Kaczmarek, 2017). This result confirms the findings of Vandebeek et al. (2021) on the importance of the social identification of directors with the board as a whole to increase their commitment to a common goal and avoiding the negative implications of conflicting subgroup identities.

Our study also points to the importance of a proper contextualization when investigating the influence of board faultlines on firm strategic outcomes. We find that the salience of the natural environment's financial materiality creates a sense of urgency that encourages directors to collaborate and exchange information and attenuates the detrimental effects of board polarization. This finding aligns with studies highlighting the natural environment as a relevant factor in determining firms' financial positions in specific industries (Grewal et al., 2021; Khan et al., 2016). This situation renders boards more prone to adopting sustainable measures that allow companies to seize the financial opportunities that may result from PESs (Manikas et al., 2021). It also fosters the connection between the social and environmental accounting literature, which emphasizes the relevance of making firms accountable for their environmental externalities (Unerman et al., 2018), and the literature on CSR strategic outcomes by providing an alternative explanation for why proactive environmental behaviors differ between firms beyond legitimacy arguments related to industries' environmental sensitivity (Cho & Patten, 2007). Additionally, this finding adds to the literature on the contingent moderating effect of external factors on the relationship between faultlines and firms' outcomes (Cooper et al., 2014; Richard et al., 2019; Wu et al., 2021), by innovatively bringing in a condition, that is, the natural environment's financial materiality, that comes from the closer connection between economic activities and nature and that plays a significant role in mitigating the disruptive effect of faultlines on PES.

Taken together, our findings on the role of internal factors and external forces corroborate the contingent nature of faultline dynamics (Kaczmarek et al., 2012a; Van Peteghem et al., 2018) by identifying two nuanced features (i.e., the CEO-Chair relative social similarity and the financial materiality of the environment) that are particularly relevant for the faultlines–PESs relationship to the bulk of the moderating forces that have been already investigated by the literature, such as board reflexivity (Veltrop et al., 2015), teams' functional heterogeneity (Leicht-Deobald et al., 2021), or the external factors related to the task environment in which firms operate (Cooper et al., 2014; Richard et al., 2019; Wu et al., 2021).

6 | CONCLUSION

This study seeks to problematize the role of board diversity in the corporate governance of environmental sustainability (Aguilera et al., 2021) and analyze the role of demographic faultlines in adopting PES and the contingent effect of the task environment on this relationship. We move from the view that strategic outcomes depend on board dynamics and information processing in a decision-making workgroup (Forbes & Milliken, 1999). Faultlines break boards into subgroups and reduce group cohesion (Thatcher & Patel, 2012). They can also increase the identification of individuals within each subgroup, reinforcing the ability to pool knowledge and engage in constructive debate to make better board decisions (Gibson & Vermeulen, 2003). However, such hypothetical lines might also be detrimental to workgroup dynamics when they inhibit cooperation and information exchange between a few polarized subgroups.

We argue that PES implementation is a major corporate decision that triggers demographic faultlines. PESs involve voluntary strategic actions (Aragón-Correa & Sharma, 2003; Sharma & Vredenburg, 1998) that require a balance between the "shared vision" within the organization (Alt et al., 2015) and a critical evaluation of alternatives to identify the right course of action. The benefits of adopting PESs are highly debated on the board, especially among individuals with different values and perceptions, as reflected by their demographic characteristics. By capturing demographic faultlines as the alignment of directors' gender and age in a 7-year sample of UK firms, we found that the nature of demographic faultlines for firms' engagement in PESs is dependent on the contingent effect of some salient features of board leadership and the external task context. In particular, we report that in the presence of faultlines, the board configuration that is more beneficial to PESs is characterized by the Chair's and the CEO's membership of the same subgroup, as a result of their social similarity, and where the context of the board decision-making is featured by a natural environment that is highly financially material.

Our findings suggest that corporations and policymakers should pay attention to increasing diversity and the *structure* of diversity in the boardroom (Molleman, 2005). By examining the simultaneous alignment of gender and age, we reconcile the debated view on the role of these demographic attributes in CSR and show that it is not just a matter of increasing the representation of directors falling into certain demographic categories (e.g., female or young board members) but also a matter of how these directors' characteristics are distributed within the board. While regulators and governance codes call for increasing female representation through gender quotas and recommend appointing young directors to lead firms' environmental transitions, there may be unintended consequences because they can create extreme situations with strong board polarization (i.e., subgroups of young females vs. old males), with negative implications for environmental strategies.

Despite its relevance, our findings have some limitations. First, while we employ a quantitative methodology that enabled us to cover a relatively large sample of firms over a long period, we note that we analyzed the boardroom based on secondary data. Further studies could complement our research by employing qualitative approaches, such as observing board meetings and focus groups, to study board decision-making in action. Second, our PES measure proxies for ex-ante engagement in environmental strategies. However, PESs may also be related to a board's desire for positive signaling and reputation. We envisage future research examining the effectiveness and performance impact of PESs and explicitly consider this perspective. Third, our study focuses on the role of demographic faultlines. However, we acknowledge that, in certain settings, board faultlines can emerge between ex-ante factions resulting from specific events (Veltrop et al., 2015). In this regard, the United Kingdom setting, in which institutional arrangements seek to avoid the emergence of such ex-ante factions in the boardroom, is unsuitable for investigating the role of factional faultlines. Further studies could explore the role of factional faultlines in settings with different institutional features (e.g., dominant culture, stakeholder vs. shareholder orientation) and where directors come to the board as representatives of specific constituencies (e.g., mandatory employee representation in Germany).

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CONFLICT OF INTEREST STATEMENT

All authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from third-party commercial databases. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the author(s) with the permission of third-party commercial databases.

ORCID

Claudia Arena https://orcid.org/0000-0001-8929-9632
Nicolas Garcia-Torea https://orcid.org/0000-0003-4301-3517
Giovanna Michelon https://orcid.org/0000-0003-0107-9809

NOTES

[1] To highlight that diversity and faultlines capture two distinct conceptual constructs, we refer to four illustrative cases of companies extracted from our database (i.e., Company A, Company B, Company C, and Company D). In particular, Company A has four directors (three males and one female) with two of them (one male and one female) being young, while the others two males being old. It exhibits a moderate level of diversity (0.5) but a low level of faultlines (0.333) being the attributes of gender and age not perfectly aligned. Conversely, Company B has eight directors (six males and two females) with the two females being also young, and the five out of the six males being the oldest. It exhibits a moderate level of diversity (0.45) but a high level of faultlines (0.718) being the attributes of gender and age almost perfectly aligned and resulting in two highly polarized subgroups (subgroup#1 with young females and subgroup#2 with old males). Company C has four directors (all males), with one being the youngest, while the other three are above 60. It exhibits a low level of diversity (0.187) but a moderate level of faultlines (0.580) due to the clustering of male directors around their age. Finally, Company D has 10 directors (seven males and three females), with significant variation in age. It exhibits moderate levels of diversity (0.600), but high levels of faultlines (0.754), giving rise to three subgroups: one of young males (subgroup#1), another of medium-age females (subgroup #3), and another one of old males (subgroup #2).

[2] Decisions associated with PES require long-term strategies to grasp new market opportunities. Examples of PES include the following: the development of hybrid vehicles; initiatives to produce or promote organic food; new product or services that are marketed as reducing noise emissions; products or technologies for use in clean, renewable energy; products and services that improve the energy efficiency of buildings or which are designed for reuse, recycling or designed to have positive effects on the environment. Instead, RESs require investments in already developed technologies to mitigate harm and risks potentially arising from unmanaged externalities (Kumar & Paraskevas, 2018). Typical activities associated with RES involve: reducing environmental emissions and the consumption of materials and water or mitigating biodiversity impacts by creating bee gardens on the roofs of new factories. They may not necessarily require a board discussion, as they are more operational in nature. Even if they require one, their non-controversial nature is unlikely to generate board disagreement.

[3] We collected board information for the year prior to the period of analysis to allow a lag between the dependent and independent variables.

[4] The two other pillar scores are useful measures of environmental strategies. However, they capture "a company's management commitment and effectiveness toward reducing environmental emission in the production and operational processes and achieving an efficient use of natural resources in the production process." As such, they consider policies and strategies aimed at mitigating environmental harm (RESs) rather than seeking new market opportunities.

[5] We computed variance inflation factors (VIFs) for all the variables, which did not suggest multicollinearity problems as none of the estimated coefficients was above an acceptable level.

[6] Examples of firms engaging in RES in our sample are BHP Billiton PLC and British American Tobacco PLC. The environmental strategy of BHP Billiton PLC focused on establishing projects aimed to enhance its operating methods, leading to a reduction in GHG emissions in their North American operations and optimizing the power generators across their drill rigs. Also, British American Tobacco PLC was concerned with improving its efficiency to reduce resource consumption. The firm established energy meters to monitor those areas that use more energy (e.g., lighting, air conditioning, and heating) to accomplish this. Interestingly, these firms had a low PES score (BHP Billiton PLC, PES = 40.937; British American Tobacco PLC, PES = 3.75). Overall, these examples suggest that the "environmental innovation" score captures PES and is un-related to RES. To internally validate our measure, we perform a correlation analysis between the PES measure and some relevant input/output indicators of environmental innovation, environmental emission, and resource use. Results of this analysis (un-tabulated for brevity) confirm that our measure captures PES and not any other form of CSR.

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AUTHOR BIOGRAPHIES

Claudia Arena is an associate professor of Accounting in the Department of Economics, Management, and Institutions at the University of Naples Federico II. Her research interests include corporate governance, accountability, and sustainability. On these topics, she has published articles in international journals such as *British Journal of Management*, *Journal of Accounting, Auditing and Finance*, *Public Management Review*, and *Business Strategy and the Environment*. She serves on the editorial board of *Accounting Forum* and *Sustainability Accounting, Management and Policy Journal*.

Nicolas Garcia-Torea is an associate professor of Accounting at the University of Burgos. He obtained his PhD from the University of Vigo. His research interests cover CSR, nonfinancial information, and their interaction with the corporate governance arrangements of organizations. He has published in international journals, such as *Organization & Environment*, *Critical Perspectives on Accounting* and *Sustainability Accounting, Management and Policy Journal*. He serves as the associate editor of the *Spanish Journal of Finance and Accounting* and as the article review editor of the *Social and Environmental Accountability Journal*.

Giovanna Michelon is a professor of Accounting at the University of Bristol. She obtained her PhD from the University of Padova. Her research interests are in the field of sustainability accounting and reporting. Her published work has focused on the governance process and systems that underpin corporate actions and accountability on sustainability issues and the role of sustainability information in capital markets. Giovanna has contributed to leading academic journals, including *Science*, *Accounting, Organizations and Society* and *European Accounting Review*. She is an associate editor of *Accounting and Business Research* and *European Accouting Review* and serves on the editorial board of several other journals.

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APPENDIX A: FAULTLINE COMPUTATION: THE ASW METHOD

The ASW was developed by Meyer and Glenz (2013). The ASW overcomes some deficiencies of previous methods, including those of the most widespread method by Thatcher et al. (2003) (Meyer et al., 2014). Although Van Peteghem et al. (2018) recently developed a procedure that adjusts Thatcher et al.'s (2003) method to consider multiple subgroups, it does not solve the other problems as ASW does. In addition to enabling the identification of more than two subgroups, the ASW allows determining to which subgroup each individual belongs, which is important in the adequate analysis of faultlines (Meyer et al., 2014). The ASW is also sensitive to changes in the homogeneity of subgroups and works with teams with more than 10 members. Furthermore, it is more robust to missing data, shows predictive validity, and is correlated with previous faultline measures (Meyer et al., 2014; Meyer & Glenz, 2013).

The ASW measures the quality of the division of a group into several subgroups considering within-subgroup homogeneity, between-subgroup separation, and the optimal number of subgroups within the whole group. Aligned with other faultline computational techniques, ASW follows a two-step procedure. First, a cluster-analytic algorithm is used to identify subgroups. Specifically, it employs Ward's algorithm (Ward, 1963) and the average linkage strategy. Second, the maximum ASW for each group is determined to identify the optimal subgroup classification for the possibilities identified in the first step. The ASW is the average of individual silhouette widths for all team members, which assesses how well an individual fits into subgroup A compared with another subgroup B. The following equation determines the individual silhouette width:

$$s(i) = \frac{b_i - a_i}{\max(a_i, b_i)}$$

where a_i measures the average dissimilarity of i to all members of subgroup A and b_i measures the average dissimilarity of i and all members of subgroup B. The method uses Euclidean distances between individuals to calculate dissimilarities. The silhouette widths range from -1 to $+1$. Values higher than 0 indicate that the person is better assigned to its current subgroup than others. The closer the value is to 1, the stronger is the association with the subgroup. Values close to 0 are ambiguous regarding subgroups that are more adequate for the individual. ASW measures the cluster solution for the whole group. The method uses an incremental improvement procedure that maximizes ASW by temporally moving members among subgroups and recalculating the ASW. The method retains the highest ASW value obtained in this iterative process as the optimal solution for capturing faultline strength. Similar to prior studies on faultlines in boards and TMTs (Crucke & Knockaert, 2016; Georgakakis et al., 2017; Vandebeek et al., 2021), we used the asw.cluster package available in R to calculate faultlines.