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Psyche, Gender and Professional Experience Diversity: Board Selection as a Means of Achieving Sustainability Goals

Douglas A. Adu*, Antoinette Flynn and Colette Grey
Department of Accounting and Finance, Kemmy Business School,
University of Limerick, Limerick, Ireland

** Corresponding Author*
Email: douglas.adu@ul.ie

Abstract
Purpose: With growing concerns in climate change and diversity, this paper examines whether Chair and CEO dissimilarities influence sustainable board decisions such as sustainable business practices in United Kingdom (UK).
Design/methodology/approach: A quantitative study was conducted by employing a unique sample of 262 listed firms in the UK from 2009 to 2018. The research approach was based on both actual and self-reported measures of sustainable business practices.
Findings: The findings show that age difference between the Chair and the CEO increases sustainable business practices. The study detects that the combined effect of Chair and CEO diversity, as measured by gender, generational gap and industry experience differences has a greater impact in increasing firms' actual greenhouse gases reduction performance and in reducing self-reported greenhouse gases reduction performance.
Research limitations/implications: The findings of the study relate to the impact of various Chair and CEO dissimilarity variables on sustainable business practices in the UK context. The results can be interpreted only across the focused sample.
Practical implications: This paper provides crucial policy implications concerning the importance of diversity where the evidence of the study shows beneficial impact of Chair and CEO dissimilarities on sustainable business practices.
Originality/value: The paper offers first time empirical evidence on the effect of various Chair and CEO dissimilarities on both actual and self-reported measures of sustainable business practices in the UK.

Keywords: Board diversity, age difference, generational gap, gender difference, industry experience difference and sustainable business practices.

1 Introduction

Global efforts that strive to minimise climatic crisis and improve climate change through the design and adoption of sustainable corporate, national, and international strategies have intensified in the last 30 years (Magd & Karyamsetty, 2021; Saad et al., 2021; Brooks & Schopohl, 2019). Particularly, corporate sustainable management actions, especially those concerning the protection of the environment and greenhouse gases (*GHGs*) emission reduction plans have been deepened in the last 10 years (Haque & Ntim, 2020). For example, policy-makers, governments, supra-national organizations, and climate scholars are progressively showing more concerns about the risks of severe climate disruption (Adu et al., 2022b; Haque & Ntim, 2022; Cordeiro et al., 2020). In particular, global institutions such as the United Nations (UN) and the European Union have issued guidlines relating to the disclosure of

information that integrates sustainable practices (Adu et al., 2022a; Martínez et al., 2022; Haque & Ntim, 2018).

Responding to this growing environmental risks, the UN has well-defined sustainable development based on 17 broad "Sustainable Development Goals" (SDGs). The deadline set for attaining the SDGs is 2030. Crucially, experts estimate the yearly investment required to achieve the SDGs to be approximately US$5 to US$7 trillion (UNCTAD, 2019). Nonetheless, with 8 years to set time limit, progress is lagging behind schedule (UNCTAD, 2019). In view of the huge financial investment needed in achieving the SDGs, scholars have suggested that firms can play a key role by making greater commitment towards achieving the SDGs (Adu et al., 2022a; Haque & Ntim, 2020). In particular, the 2021 Glasgow Climate Pact, a global agreement on ambitious net-zero commitments covering roughly 90% of global emissions and 90% of global GDP, was recently reached at the 26th United Nations Climate Change Conference (COP26) (Hque & Ntim, 2022; Kyaw et al., 2022). It is a non-binding commitment from 153 countries covering four areas of priorities: (i) mitigation, (ii) adaptation, (iii) finance, and (iv) collaboration (United Nations, 2021). Although this is regarded as a significant step toward achieving the emission reduction target to keep the increase in the global temperature to 1.5°C, it is likely to depend on the degree of compliance with COP26 commitments by the signatories, especially large businesses operating in developed, as well as close collaborations among the multilateral organisations, governments, market participants, and civil societies (Rjiba & Thavaharan, 2022; Haque & Ntim, 2022).

Consequently, a number of countries and firms are increasingly employing various *GHGs*-related strategies to reduce the emission of *GHGs* (Baboukardos, 2018; Haque & Ntim, 2018). For instance, in the United Kingdom (UK), the Department for Environment, Food and Rural Affairs (DEFRA) working on behalf of the government released guidelines on the measurement and disclosure of *GHGs* emissions in 2009 (Adu et al., 2022a). The guidelines were issued to urge firms in the UK to reduce their contribution to *GHGs* emission and climate change.

It is worth noting that recent corporate scandals have drawn more concerns on corporate governance (CG) structures (Ullah et al., 2019; Hasan et al., 2014), particularly on the significance of boards in terms of their roles, effectiveness, composition and diversity (Yamori et al., 2017; Carter et al., 2010). The board can help firms to link well with the outside environment, which can facilitate access to critical resources (Estélyi & Nisar, 2016; Wellalage & Locke, 2013For example, it has been argued that board diversity can improve CG structures (Zhou et al., 2019), with beneficial impact on sustainable business practices (*SBPs*) (Adu et al., 2022a). Diversity is concerned with less homogenous boards where members are equipped with diverse skills, experience and demographics (Zhou et al., 2019). Board diversity can therefore positively impact on sustainable decisions through better decision-making by bringing a range of different perspectives to the board (Van Der Walt et al., 2006; Arfken et al., 2004). For example, board diversity improves board independence which has a beneficial impact on monitoring and advising role of the board (Sarhan et al., 2019). In addition, Number and Velte (2021) maintain that at the corporate level, improving carbon emission reduction activites can be achieved through corporate decision-making which originates at board level and may be shaped by the composition of the board.

Past research has measured diversity in different ways. Harrison and Klein (2007) maintain that diversity within an organization can indicate separation in terms of differences in opinion or position of members in the group. Evidently, the separation dimension of diversity can lead to opposititon or disagreement within a group (Harrison & Klein, 2007). Diversity may also be indicative of variety which refers to differences in category or kind (Harrison & Klein, 2007), for instance, differences in knowledge, experience and information among members within a

group. In addition, diversity within a group may be indicative of disparity which focuses on differences in concentration of valued social resources or assets such as pay and status (Harrison & Klein, 2007). To deepen our analysis, the variety measure of diversity is employed in this study.

Studies on board diversity continue to receive much attention as there is a growing concern in understanding how board attributes and demographics can impact on firms' decisions to engage in sustainable business initiatives (Azman et al., 2020; Elmagrhi et al., 2019; Hassan et al., 2015; Giannarakis, 2014). Board diversity can also improve the decision-making process of the board through interaction among board members (Zhou et al., 2019). To a large extent, the strength of the decision-group as a unit through synergy can be affected by the degree of cognitive conflict among the members within the group (Goergen et al., 2015). For Zhou et al. (2019), the judgement and evaluation of strategic issues among the board members should be enhanced when decisions are made through deliberations encouraged by cognitive conflict emerging from demographic divergences. This argument is largely premised on sociological theories of homophily and upper echelons (Zhou et al., 2019; Goergen et al., 2015). A homophily perspective expects that an increased number of interactions and personal relationships between individuals who possess comparable social or demographic traits (McPherson et al., 2001). Homophily hypothesis predicts that demography considerably impacts corporate directors' appreciation of the different management conditions they encounter and also influence their decisions (Hambrick & Mason, 1984).

In this study, we investigate whether demographic differences between the Chair and the CEO can effect firms' sustainable business practices performance. The Chair and the CEO are the leaders of the board and the most dominant players in the determination of firms' sustainable board decisions (Adu et al., 2022b; Zhu et al., 2021). It is worthy to note that, in the UK, these roles at the top of the board have been split to ensure that one individual does not dominate board decisions on strategy and governance. This best practice requirement is one of the main pillars in UK CG and has been enshrined in the UK CG Code all through its various revisions over the years. For instance, the current UK CG Code 2018 specifies the appointment of an independent Chair, as well as the split between the roles of the Chair who leads the board and CEO who is the leader of the management team. However, simple separation of the roles between the CEO and Chair is not sufficient to ensure good governance (as per the 2018 UK Governance Code). There needs to be greater diversity between the roles including age, gender and professional experience diversity.

The crucial demographic dissimilarity measure in this study is age. Age demography plays a key role in the interactions within a group (Ferris et al., 1991). Age and the generational gap representing a difference of mindsets can lead to greater the diversity. When the individuals on the board are from the same generation, they share comparable past experiences and social fashions (Harrison et al., 1998; Wagner et al., 1984). For example, they might have gone to the same secondary schools, universities, and may be members of the same social groupings (for example, golf clubs, lions clubs). The implication is that they tend to be mentally linked and similarly oriented in the governance process (Pelled et al., 1999; Bantel & Jackson, 1989). Therefore, when the Chair and CEO are of similar age group, they tend to have less cognitive conflicts which can reduce the capacity of the boards' monitoring role (Zhou et al., 2019). Alternatively, a larger *Chair-CEO* age divergence can lead to increased cognitive conflicts which promote board independence and effective monitoring (Zhou et al., 2019; Goergen et al., 2015; Adam & Ferreira, 2007). We predict that an increase in the cognitive conflicts induced by *Chair-CEO* age dissimilarity may be valuable in terms of improving boards' sustainable decisions, thereby improving *SBPs* of firms.

In addition, diversification of corporate boards on the basis of gender and industry experience, has become a key global policy issue (Zhou et al., 2019; Gyapong et al., 2016; Adams & Ferreira, 2009). For instance, recently there has been a focus on identifying the benefits and effectiveness of women in key positions such as the Chair and CEO representation on boards (Brahma et al., 2021; Birindelli et al., 2019). In some countries, mandatory gender quotas have been introduced (for example, France, Spain and Norway). Other countries including the UK and the United States have implemented business-led voluntary approach with regards board gender diversity.[1] In particular, evidence from Hampton-Alexander Review in 2021 on FTSE women leaders revealed that there are more women Chair and CEO role combinations, and a significant increase in women on the executive teams of FTSE 350 firms. Meanwhile, it has been suggested that *SBPs* is closely related to gender diversity and that firms can enhance their *SBPs* with gender-diversified *Chair-CEO* combinations (Lu & Herremans, 2019).

Other scholars also maintain that industrial experience differences between the Chair and the CEO can impact firm outcomes (Zhou et al., 2019; Peni, 2014). Accordingly, we posit that an increase in the cognitive conflicts stimulated by *Chair-CEO* gender and industry experience differences may enhance boards' sustainable decisions which can positively influence *SBPs*. We investigate these hypotheses by examining 262 listed firms in the UK from 2009 to 2018. Effective CG structures are crucial for investments in sustainable business initiatives (Adu et al., 2021), which are vital for the achievement of the SDGs and *GHGs* emission reduction targets (Haque & Ntim, 2020). It is therefore predominantly important to understand how *Chair-CEO* attributes could improve firm's commitment to reduce *GHGs* emission reduction given the threat of climatic crisis.

Based on the above discussions, our study focuses on the following three crucial objectives. Firstly, our study investigates whether Chair-CEO diversity as measured by a combination of generational age gap, gender and industry experience has effect on SBPs of firms in the UK. Secondly, the study examines the impact of age difference between the Chair and CEO on SBPs of firms in the UK. Finally, the study assesses the effect of Chair-CEO differences on the basis of gender and industry experience on SBPs of firms in the UK.

Our contribution to the literature is fourfold. Firstly, we distinctively offer new insight on the crucial role of the combined effect of *Chair-CEO* diversity as measured by gender, generational age gap and industry experience differences in significantly increasing the actual *GHG*s emission reduction performance and reducing firms' self-reporting *GHGs* reduction performance. Secondly, the study offers initial evidence on the effect of *Chair-CEO* age differences on various measures of *SBPs*. Empirical research on the association between *Chair-CEO age* dissimilarity and *SBPs* is rare. Systematic literature search reveals that, no available empirical study exists as regards to *Chair-CEO* age dissimilarity and *SBPs*. Existing literature have mainly examined the direct impact of age on *SBPs* (Elmagrhi et al., 2019; Cucari et al., 2018; Giannarakis, 2014; Wiernik et al., 2013), without exploring how *Chair-CEO* age dissimilarity may influence *SBPs*. This study is unique because the proxy of age diversity is centered on the differences with respect to age between the Chair and the CEO, two crucial board positions. Additionally, we distinctively investigate how a larger difference with respect to age between the Chair and the CEO, known as a generational gap, older Chair and younger Chair may influence *SBPs* performance of firms.

Thirdly, we contribute to literature by providing first time empirical evidence on how other key *Chair-CEO* divergences including differences in gender and industry experience, may influence firms' *SBPs* performance. Finally, our study contribute to the limited literature by

[1] The gender quota in Norway is maintained at 40%, Spain has a similar quota and France seeks 50%. The European commission strives to achieve 40% women representation on boards of firms in Europe. However, this has been challenged by countries including Malta, Czech Republic and Hungary (Traynor 2012).

assessing the impact of *Chair-CEO* age, gender and industry experience differences on different components of *SBPs*. This study is distinct because the proxy of *SBPs* is specifically based on two key measures, namely the actual *GHGs* reduction performance and self-reported *GHGs* reduction performance (*SGRP*). In particular, the limited literature on age and *SBPs* are based on a one proxy of *GHGs* reduction indicators. Meanwhile, some climatic scholars have propose the need for carbon performance studies to separate *GHGs* emission reduction indicators into self-reported *GHGs* reduction performance and actual *GHGs* reduction performance (Rahman et al., 2020; Qian & Schaltegger, 2018: Ziegler et al., 2011). This is expected to deepen the investigation (Adu et al., 2021; Haque & Ntim, 2020). In particular, Haque and Ntim (2020) mainatin that, using one proxy of *GHGs* reduction performance can lead to ambiguous and inconsistent results. For example, the use of self-reported measure of *GHGs* reduction indicators alone can not sufficiently indicate whether self-reported *GHGs* activities lead to actual decline in the emission of *GHGs* (Adu et al., 2022a; Haque & Ntim, 2020). Accordingly, this offers a fertile ground for additional analysis.

The rest of the paper is structured as follows. Section 2 focuses on reviewing the extant literature concerning the effect of diversity and board characteristics on *SBPs*. In addition, the section develops hypotheses on organizational theories of social ties and diversity. Section 3 provides the data and methodology. In section 4, we present the results of the study, whilst the test for robustness is provided in Section 5. Finally, Section 6 provides the conclusions along with recommendations and a discussion of the potential for future research.

2 Literature Review and Hypothesis Development

2.1 Board Diversity, Board Characteristics and Sustainable Business Practices

Age is a key demographic because it can continuously impact on board member's attitude, decision-making and processing of information (Serfling, 2014; Yim, 2013). Studies show that individual's engagement in sustainable initiatives increases as they advance in age. Thus, it has been suggested that older individuals tend to engage in environmental protection initiatives (Elmagrhi et al., 2019). A probable explanation for this phenomenom could be that individual's propensity to gain understanding of sustainable issues and the risk posed by climate conditions increases over their lifetime (Elmagrhi et al., 2019). The implication is that younger individuals may be associated with less experience and thus may not pay attention to climate risk and sustainable issues (Elmagrhi et al., 2019; Post et al., 2011). In particular, Post et al. (2011) suggest that sustainable experience of executives progressively improve over time, and thus, older executives may have increased level of sustainable moral reasoning compared with younger executives. Thus, boards with older executives may be associated with superior sustainable decisions than boards with younger executives. In support, Bilimoria and Piderit (1994) posit that older directors are characterized by their general experience and maturity. Empirical investigation by Elmagrhi et al. (2019) show that age of female directors positively influence the environmental performance of firms. In contrast, Giannarakis (2014) finds insignificant association between the age of the board and corporate social responsibility disclosures in the US.

Others argue the opposite and contend that younger directors are more keen on climate change and are determined to encourage corporate reforms that seek to enhance the quality of the environment (Ibrahim & Hanefah, 2016; Hafsi & Turgut, 2013; Liere & Dunlap, 1980).

For example, younger directors may introduce more innovative and techniques which can positively influence sustainable performance (Cucari et al., 2018). Related to this study, research exploring the relationship between the age of the board and *SBPs* is scarce. A seldom example is Bantel and Jackson (1989) who find that younger board members have superior

education and tend to evaluate business risks well; hence, tend to develop sustainable practices in business operations.

Also, the *SBPs* performance may be influenced by board diversity factors such as gender, industry experience, competence and independence. Some scholars suggest that women directors tend to have more protective attitude towards the environment (Cordeiro et al., 2020; Wehrmeyer & McNeil, 2000). Others also observe that female directors pay more attention to stakeholders interests and promote *SBPs*-related policies (Orazalin & Baydauletov, 2020; Post & Byron, 2015). The empirical evidence on the effect of gender diversity on sustainable performance is mixed. For instance, a systematic review by Ludwig and Sassen (2022) reveal that, 14 out of 19 articles report a positive link between gender diversity and sustainable performance of firms. Five of the studies find no association between gender diversity and sustainable performance, and only 3 studies document an inverse relationship between gender diversity and sustainable performance.

Evidence also suggests that industry experience and the educational attainment of the Chair and CEO can enhance the sustainable performance of firms (Zhou et al., 2019; Prabowo et al., 2017). The authors explain that industry experience avails the board members superior monitoring capabilities and the alignment of managers interest with the broader sustainable value creation. In particular, Hitt and Tyler (1991) maintain that the level of education can affect directors' cognitive ability and value system and that can also impact on firm's strategic decisions. For example, Hambrick and Mason (1984) posit that corporate executives level of education can have an effect on firm's level of innovativeness and thus sustainable decisions. Further, Diamantopoulos et al. (2003) maintain that more educated corporate executives may put more pressure on their companies to limit sustainable related problems, because they tend to possess superior sustainable understanding than less educated directors. However, in a related study, Gadenne et al. (2009) find no significant relationship between the level of education of corporate executives and environmental behaviour or awareness.

There is a growing literature investigating the effect of various board attributes on *SBPs* performance of firms. The board plays a key role in integrating sustainability into CG (UNEPFI, 2014). One key attribute is the size of the board (Zhou et al., 2019). The size of the can be employed as a proxy to assess board governance (Zainon et al., 2012). Some scholars maintain that larger boards with more expertise may have greater capacity to better monitor executives to ensure they engage in sustainable value creation (Adu et al., 2022a; Giannarakis, 2014). Larger board size can promote broader discussion on innovative concepts and strategies (Esa & Ghazali, 2012) including *SBPs* (Giannarakis, 2014). In contrast, others suggest that decision-making can be problematic in larger boards due to coordination and communication issues (Jensen, 1993), suggesting that as the size of the board increases, the monitoring role becomes weak. Empirical evidence on the association between board size and *SBPs* is mixed. One strand of literature finds that larger boards enhance firms engagement in *SBPs* (Ludwig & Sassen, 2022; Adu et al., 2022a; Giannarakis, 2014). Other studies propose that larger board size leads to poor board decision making and less *SBPs* (Eisenberg et al., 1998; Lipton & Lorsh, 1992). Empirically, Walls et al. (2012) and Uwuigbe et al. (2011) document a negative link between board size and corporate environmental disclosure.

Board independence is also suggested to influence firm outcome. For instance, Ludwig & Sassen (2022) posit that board independence plays a crucial role in increasing sustainable initiatives. Board independence enables a greater stakeholder connection through sustainable channels, increasing transparency, and preventing the board's interest from being focused solely on financial performance (Ludwig & Sassen, 2022; Ntim & Soobaroyen, 2013), thereby increasing sustainable performance (Cucari et al., 2018; Michelon & Parbonetti, 2012). Others

argue the opposite (Crifo et al., 2019; Walls et al., 2012) or observe insignificant association between board independence and *SBPs* (Akbas, 2016; Walls & Hoffman, 2013).

2.2 Social Ties, Demographic Similarities and Sustainable Business Practices

Within the context of CG literature, a board is considered to be independent when the board members do not have any form of business links with each other (Zhou et al., 2019). This conventional classification of independence of the board may not capture the probable effect of social independence of the board (Hwang & Kim, 2009). For instance, the extent to which members of the board share informal social connections with one another can also influence firm outcomes (Goergen et al., 2015; Zhou et al., 2019). It has been suggested that informal social ties among individuals serving on a board is not beneficial as it does not serve in the best interest of shareholders (Fracassi & Tate, 2012). For Zhou et al. (2019), this can potentially weaken the boards'monitoring capacity.

The establishment of social ties among board members can be explained from sociological and management theoretical perspectives of upper echelons and homophily (Zhou et al., 2019). Firstly, upper echelons theoretical perspective maintains that directors' demographics largely affect their interpretation of different kinds of management conditions and this influences their decision-making (Hambrick & Mason, 1984). Thus, demographic differences can influence group thinking and processes (Zhou et al., 2019). For example, demographic diversity can have a detrimental impact on group cohesion (O'Reilly et al., 1989; Katz,1982; Lott & Lott, 1961) and the flow of information among group members (Smith et al.,1994; Wagner et al.,1984). The problems associated with group cohesion and flow of information can lead to increased group conflicts (Eisenhardt & Schoonhoven, 1990).

One of the most striking and solid empirical regularities of social life is the "homophily principle," which is the observed tendency of "like to associate with like" (Burt 1991; Marsden 1987; McPherson & Smith-Lovin 1987; Verbrugge 1977; Lazarsfeld & Merton 1954). The homophily principle was first introduced in 1954 by social scientists Paul Lazarsfeld and Robert Merton. The scholars maintain that similarity promotes connection. With regard to a variety of dimensions including race, age, gender, socioeconomic status, and education, friends, spouses, coworkers, colleagues, and other professional and recreational associates all tend to be more similar to each other than randomly chosen members of the same population (Kossinets & Watts, 2009). Therefore, the theory of homophily (i.e., an affinity for similar others), maintains that a higher number of interactions can potentially create a lot of informal and social ties among individuals in a group who share similar demographic characteristics (Dumas et al., 2013; McPherson et al., 2001; Marsden, 1987). That is individuals like to interact and communicate with similar individuals (Zhu et al., 2021). For instance, Pfeffer (1983) conducts a study on the relationship between the dimensions of management control and demographic attributes. The author observes that socialization or personal control tends to be more effective when members are more homogeneous. Pfeffer (1983) explains that this may be as a result of shared perspective, joint experience and similarity of background. The author maintains that such increased informal control can ensure the use of familiar vocabulary which can provide ground for co-operation or mutual understanding. Hence, within this context, similarity between the Chair and the CEO ensures the interaction between them become increasingly affirmative and reduces different opinions, thereby weakening the monitoring intensity of the board (Zhu et al., 2021).

However, when there is demographic differences, impersonal and bureaucratic controls will be witnessed (Zhou et al., 2019). Others scholars suggest that heterogeneous groups tend to be associated with lower performance in a stable business environment as the group would need formal interactions (Murray, 1989). By contrast, heterogeneous teams are desirable in an

unstable business environment as it can facilitate adaptation (Murray, 1989). Proponents of this view assert that social connections between board members and the CEO can weaken the effectiveness of the boards' monitoring role (Lee et al., 2014; Fracassi & Tate, 2012; Murray, 1989). For instance, Fracassi and Tate (2012) observe that the existence of social ties between board members and CEO weakens the intensity of board monitoring. The authors find that in such companies, CEOs undertake high level of value-destroying acquisitions (Fracassi &Tate, 2012) with an increase in agency conflicts (Lee et al., 2014).

Accordingly, we argue that the intensity of the informal connection between the Chair and the CEO is determined by the differences between the two. More importantly, it is expected that the greater the age difference between the Chair and the CEO , the weaker the tendency to build strong social connections (Zhou et al., 2019; Goergen et al., 2015; Fracassi & Tate, 2012). This is expected to increase cognitive conflicts which in turn enhances the supervisory function of the board as well as potentially increasing sustainable initiatives by the board (Goergen et al., 2015). Empirical research exploring the effect of social connections within the board on *SBPs* performance of firms is scarce.

2.3 Age Dissimilarity between the Chair and CEO

Based on the above-mentioned theoretical arguments and the limited empirical evidence, it is expected that there will be lower board independence when the individuals serving on the board share similar backgrounds and demographics. As discussed in Section 2.1, there is scarcity of research on the influence of demographic differences on *SBPs*. In an attempt to extend demographic dissimilarity research to sustainable business initiatives, we investigate whether demographic differences between two influential individuals on the board, the Chair and the CEO, affect *SBPs* performance.

Specifically, we employ age as our key demographic dissimilarity. The justification for doing this is twofold. Firstly, age is a considerable element that can increasingly influence a person's information processing, decision-making, attitude and investment behaviour (Zhou et al., 2019; Serfling, 2014; Yim, 2013; Bucciol & Miniaci, 2011; Hong et al., 2000; Chevalier & Ellison, 1999; Rhodes, 1983; Taylor, 1975). Secondly, and crucially, scholars maintain that in the CG process, when individuals serving on a board are from the same generation, they may have a lot of things in common including sharing social trends and similar historical events (Pelled et al., 1999; Harrison et al., 1998), thus, they tend to be like minded and mentally attached (Bantel & Jackson, 1989; Wagner et al., 1984).

Age similarity between the Chair and CEO can be a key signal of strong informal or social connections between the two. In particular, Zhu et al. (2021) argue that this originates from "similar attraction" phenomenon where individuals like to maintain social connection with similar individuals. Meanwhile, age similarity between the Chair and the CEO can have a detrimental effect on the monitoring task of the board (Zhu et al., 2021; Zhou et al., 2019). Because of stronger social and personal interactions between the Chair and the CEO, they will share similar experiences, beliefs, opinions and attitude (Zhu et al., 2021). Thus, there will be less cognitive conflict between the two (Zhou et al., 2019), which weakens the intensity of the boards' supervision (Lee et al., 2014).

In contrast, a larger age difference between the Chair and the CEO can lead to greater cognitive conflicts which can reinforce the monitoring task of the board (Zhou et al., 2019; Goergen et al., 2015; Adams & Ferreira, 2007). The age difference between the Chair and the CEO results in diversified ways of thinking and problem solving (Zhu et al., 2021). We contend that age dissimilarity between the Chair and the CEO can enhance cognitive conflicts. The increased cognitive conflicts will ensure superior monitoring and proper alignment of

executives' interests with broader stakeholder values which can serve as a tool to increase investments in sustainable business enterprises.

More importantly, Adu et al. (2022a) and Cordeiro and Sarkis (2008) assert that, powerful corporate leaders (specifically Chairs and CEOs) can rely on superior self-reported approach in their *GHGs* reduction initiatives. For instance, the Chair and the CEO may employ *GHGs* reduction performance measures as a management impression strategy rather than concentrating on actual governance mechanisms (Adu et al., 2022a). In this context, firms' efforts to enhance their corporate image through self-reported climate activities can potentially lead the Chair and the CEO to adopt impression management strategies. In this case, the firms may employ greenwashing approach mainly through the transmission of erroneous disclosures on *GHGs* reduction initiatives so as to gain the approval of stakeholders (Adu et al., 2022a; Talbot & Boiral, 2015; Boiral, 2013). Noticeably, while this can potentially improve the firms' image and boost the relationship between the firms and their broader stakeholders, it cannot lead in actual reduction in *GHGs* emission. The discussion above leads to our first set of Hypotheses (*H1*) as stated as below:

H1a. Diversity between the Chair and CEO has a positive relationship with sustainable business practices (SBPs) and greenhouse gases emission reduction (GHGs) of a firm, and these associations are expected to be greater for self-reported GHGs measure than for actual GHGs measures.

H1b. Age dissimilarity between the Chair and the CEO has a positive relationship with sustainable business practices (SBPs) and greenhouse gases emission reduction (GHGs) of a firm, and these associations are expected to be greater for self-reported GHGs measure than for actual GHGs measures.

H1c. Age dissimilarity between the Chair and the CEO has a positive relationship with sustainable business practices (SBPs) and greenhouse gases emission reduction (GHGs) of a firm, and these associations are expected to be greater when the Chair is older than the CEO.

More precisely, we seek to ascertain whether a larger age difference between the Chair and the CEO can influence firms' *SBPs* performance. As Zhu et al. (2021) and Zhou et al. (2019) reason, fewer social connections resulting in more cognitive conflict between the Chair and the CEO are expected to occur when the Chair and the CEO are from different generations. Accordingly, the study examines a more specific hypothesis as stated below:

H2: A generational difference in age between the Chair and the CEO has a positive relationship with sustainable business practices (SBPs) and greenhouse gases emission reduction (GHGs) of a firm, and these associations are expected to be greater for self-reported GHGs measure than for actual GHGs measures.

2.4 Chair-CEO Gender and Industry Experience Dissimilarity

Additionally, we are interested in gender and industry experience differences between the Chair and the CEO. Drawing from economics and sociology literatures, we propose that the gender and industry experience dissimilarities between the Chair and the CEO can enhance firms' *SBPs* performance. This is based on the argument that when the Chair and the CEO are from the same gender or possess similar industry experience (including academic discipline), the likely of cognitive conflict between them reduces (Zhou et al., 2019; Goergen et al., 2015; Fracassi & Tate, 2012). This leads to informal connections between the Chair and the CEO.

These mutual gender alignment and industry experiences, offer a platform for homophily (that is, an affinity for similar others), opening the gateway to interactions and developing social ties (Fracassi & Tate, 2012). Whether it is deliberate or not, individuals tend to like an informal mutual understanding and are more contented with others who possess similar socio-economic features and experiences (McPherson et al., 2001; Marsden, 1987). The increase in the informal contacts and social connections when the Chair and the CEO are from the same gender or share similar industry experience can potentially weaken the intensity of the board's monitoring role (Zhou et al., 2019; Fracassi & Tate, 2012; Murray, 1989).

By contrast, "contact between similar people occurs at a higher rate than among dissimilar people" (McPherson et al., p. 416). This suggests that when the Chair and the CEO are from different gender and have different industry experience, the tendency for informal contacts and social connection decreases. It is expected that *Chair-CEO* gender and industry experience dissimilarities will lead to cognitive conflicts which can improve the board's monitoring role (Zhou et al., 2019; Goergen et al., 2015). We maintain that *Chair-CEO* gender and industry experience dissimilarity will increase cognitive conflicts resulting in better monitoring and proper alignment of corporate executives' interests with sustainable business initiatives. Based on Zhou et al. (2019) suggestion that fewer social connections between the Chair and the CEO as a result of gender diversity and diverse industry experiences would initiate cognitive conflict , we formulate the third Hypothesis (*H3*) as follows:

H3. Chair-CEO gender and industry experience differences have positive relationship with sustainable business practices (SBPs) and greenhouse gases emission reduction (GHGs) of a firm, and these associations are expected to be greater for self-reported GHGs measure than for actual GHGs measures.

3 Data and Methodology

3.1 Sample

Our initial sample is based on 2,620 firm-year observations from 262 non-financial listed firms from the UK FTSE 350 index from 2009 to 2018. The choice of FTSE 350 was mainly informed by the broad-spectrum nature of the index. In addition, the index has several industries with large firms that may set the pace for *Chair-CEO* diversity and *GHGs* disclosure (Adu et al., 2022a: Tauringana & Chithambo, 2015; Brammer & Pavelin, 2006). We collected the *SBPs* data including *GHGs* performance data from Bloomberg. We collected the self-reported *GHGs* reduction activities from the annual report of the firms. The *Chair-CEO* dissimilarity data was also manually gathered from the annual reports of the firms. We manually collected data on CG from the firms' annual reports. The financial data was retrieved from Refinitiv Eikon database.

We excluded 41 observations due to missing firm-level *SBPs* data in Bloomberg database. Our final sample comprised of an unbalanced panel of 2,579 firm-year observations across 10 years. Our analysis spans the time period following the enactment of the legislation, UK 2008 Climate Change Act. Importantly, the time period of our analysis covers the first two UK carbon budgets that ended in 2017 and part of the third budget that will end in 2022. The industry-wise distribution of our sample is provided in Table 1. We classify the sample into carbon-intensive and non-carbon-intensive sectors following the work of Konadu et al. (2022) and Baboukardos (2017). From Table 1, materials, industrials, energy and utilities sectors are grouped under the carbon-intensive label due to the intensity of their emissions (Konadu et al., 2022; Baboukardos, 2017). The remaining sectors, including health care, technology, consumer staples, consumer discretionary, services, communications and telecom, are all classified as non-carbon-intensive sectors (Konadu et al., 2022). The total GHGs emissions (GHG and CO_2P) for the full sample

is 5,068,405.02 tonnes. Carbon-intensive firms, on the other hand, recorded a total of 3,966,847.80 tonnes (78.27%) of GHGs in the sample which is significantly higher than non-carbon-intensive firms with total emission of 746,048.17 tonnes (21.73%).

3.2 Sustainable Business Practices Proxies

Table 2 provides the definition of the variables employed in examining our hypotheses. Following Adu et al. (2022a), we use five measures of *SBPs* as our dependent variables, including actual and self-reporting measures of *GHGs* performance. Specifically, we employ four actual *SBPs* proxies: *ESG* performance (*ESGP),* environmental performance (*ENVP),* greenhouse gases emission reduction performance (*GHGP)* and CO_2 reduction performance (CO_2P). Additionally, we apply our analysis to the symbolic measures by employing one self-reporting *GHGs* reduction performance (*SGRP*).

3.3 Measures of Age Dissimilarity

Consistent with prior research (Zhou et al., 2019; Harrison & Klein, 2007), we employ the variety dimension of diversity in this study. Specifically, the study focuses on diversity on the basis of age, gender and industry experience (Harrison & Klein, 2007). Following Zhou et al. (2019), we use seven variables to assess *Chair-CEO* differences. We apply *Chair-CEO* diversity as measured by gender, generational age gap and industry experience differences. The variable captures the combined effect of *Chair-CEO* diversity. The *Chair-CEO* age dissimilarity which signifies the age of the Chair minus the age of the CEO. The difference can be positive or negative suggesting that cognitive conflict may arise between the two in instances when the Chair is older or younger than the CEO, respectively. Zhou et al. (2019) posit that cognitive conflict between the Chair and the CEO will be greatest when there is a generational age dissimilarity between the Chair and CEO. In particular, Zhou et al. (2019) and Strauss and Howe (1997) refer to a generational gap as an age difference of at least twenty years. Following Zhou et al. (2019) and Strauss and Howe (1997), and to describe the *Chair-CEO* generational gap, we employ Chair and CEO age gap 20, that is equal to 1 when the absolute difference between the Chair and CEO is greater than or equal to 20 years, and 0 otherwise.

We also focus on another set of key variables that capture Chair and CEO differences. To capture for gender dissimilarity, we follow Zhou et al. (2019) by using *Chair-CEO* gender differences, which equals to 1 when the Chair and the CEO are of different gender, and 0 otherwise. In addition, we employ Chair and CEO industry experience dissimilarity to capture the difference in terms of industry experience between the Chair and the CEO as applied by Zhou et al. (2019). This variable is equal to 1 when the Chair and CEO have different industry experience, and 0 otherwise.

3.4 Measures of Corporate Governance and Firm Characteristics

We employ a number of variables that are often used in CG studies as proxy of board and firm specific characteristics. In line with previous studies (e.g., Adu 2022b; Nguyen et al., 2021; He et al., 2021; Grey et al., 2020; Shahab et al., 2018; Grey et al., 2013), we include board size, board independence, firm size, capitalization, existence of sustainability committee, audit firm size, leverage, age of the firm, and, research and development as control variables. These control variables were included to reduce potential excluded variable bias. Table 2 fully explains all the variables.

3.5 Empirical Models

We follow prior studies (Konadu et al., 2022; Ullah et al., 2022; Adu, 2022a; Mardini & Lahyani., 2021; Elsayih et al., 2021; Grey et al., 2020; Mohammed et al., 2019), by initially using ordinary least squares regression (OLS) models. Our first equation assess the effect of age dissimilarity between the Chair and the CEO on *SBPs* proxies. We also include the control variables and dummies (year and industry). Following Zhu et al. (2021) and Zhou et al. (2019), our first equation is stated as follows:

$$SBPs_{it} = \alpha_0 + \beta_1 Chair\text{-}CEO\ dissimilarity_{it} + \beta_2 Board\ characteristics_{it} + \beta_3 Firm\ characteristics_{it} + \beta_4 Year_{it} + \beta_5 Industry_{it} + \varepsilon_t \quad (1)$$

Where:
SBPs is the *SBPs* proxies based on the model, which is either *ESGP*, *ENVP*, *GHGP*, *CO_2P* or *SGRP*. Likewise, *Chair-CEO* dissimilarity denotes *Chair-CEO* age dissimilarity variables, based on the model, which is either *Chair-CEO* diversity, *Chair-CEO age difference, Chair-CEO age gap 20*, older Chair and younger Chair.
Our second model examines the impact of *Chair-CEO* gender and industry experience differences on the *SBPs* proxies. Following Zhu et al. (2021) and Zhou et al. (2019), we propose the following model:

$$SBPs_{it} = \alpha_0 + \beta_1 Chair\text{-}CEO\ difference_{it} + \beta_2 Board\ characteristics_{it} + \beta_3 Firm\ characteristics_{it} + \beta_4 Year_{it} + \beta_5 Industry_{it} + \varepsilon_t \quad (2)$$

Where:
SBPs denotes the *SBPs* proxies as illustrated in Eq. (1). The *Chair-CEO* difference refer to either gender difference or industry experience difference measures, depending on the specification.

3.6 Descriptive Statistics

Table 3 shows the summary statistics of the main variables. Panel *A* of the tables reveals that *ESG* performance ranges from 0 to 70.12%, with a mean of 29.53%. In addition, the average of environmental performance is 20.71% with figures ranging from 0 to 74.42%. The results in Panel *B* of the table show that, the mean value of the performance of the actual greenhouse gases reduction is 4.49, while the average of *CO_2P* is 2.28. Further, the results captured in Panel *C* of the table reveal that the average score of self-reported greenhouse gases reduction performance is 2.49, and the highest score is 20.
The results in Panel *D* shows the summary statistics of different types of the Chair and the CEO characteristics. The mean of *Chair-CEO* diversity is 1.09, and the maximum score is 3. The mean age difference between the Chair and the CEO is 5.89 years. The study observes at least twenty years of age difference between the Chair and the CEO for 12% of all firms in the sample. We also observes that there is gender difference between the Chair and the CEO for 4% of our data. The average of industry experience difference (Chair-CEO industry experience) is 35% in our sample. We observe 57% and 3% for older Chair and younger Chair, respectively. Mean board size is 10, which is similar to the evidence of Haque and Ntim (2018). Independent directors, on average, represent 68% of the board. We observe that 70% of the firms in our sample have sustainability committees. This evidence is consistent with the findings of prior research in the UK (Al-Shaer and Zaman, 2019).

The Pearson correlation coefficients of the variables included in our analysis are provided in Table 4. The results in the table indicate that *Chair-CEO* dissimilarity variables have positive and significant corelation with the *SBPs* performance measures. For instance, the *Chair-CEO* dissimilarity variables have positive and significant correlation with *ESGP*. Thus, the findings of the correlation analysis offer initial support to our main hypotheses. Further, the results show low correlation among the CG characteristics and the other control variables. According to Liu et al. (2014), low correlation among independent variables indicate that multicollinearity is not a major issue. Collectively, the results indicate that our variables appear to be appropriate for ordinary least squares regression.

4 Empirical results

4.1 Chair and CEO Dissimilarity Results

The study provides the results of the ordinary least squares analysis of the association between *Chair-CEO dissimilarity* and sustainable business practices (*SBPs*) in Tables 5 to 9. In all our estimations, we add all the control variables and the dummy variables. Table 5 provides results for the *SBPs* proxy measured by environmental, social and governance performance (*ESGP*). The estimated results shown in Table 5 offer support for *H1a* in that *Chair-CEO* diversity has a positive relationship with the *ESGP* of a firm. This suggests that firms with greater *Chair-CEO* diversity are associated with an increase in *ESGP*. The coefficients on *Chair-CEO age difference* and *older Chair* are positive and significant at the 1% level (see Columns 2 and 4), respectively. These findings offer strong empirical support to *H1b* that *Chair-CEO age dissimilarity* can have a beneficial impact on *ESGP*. Thus, this supports our reasoning that age diversity between the Chair and CEO can improve the boards' sustainable decisions and thereby enhancing *ESGP*. By contrast, the results in Column 5 of the table show that the coefficient on *younger Chair* is insignificant, suggesting that *H1b* is not empirically supported for this measure. The evidence also offer support to *H1c* in that the coefficient on older Chair (3.123) is significant and greater in magnitude than that of younger Chair.

As we predicted, Table 5 regression results show that the coefficient on the Chair-CEO generational age gap (*Chair-CEO age gap 20)* has a positive and significant relationship with *ESGP*, thereby offering strong empirical support for our second hypothesis. Noticeably, the coefficient (0.689) is higher than the other Chair and CEO age dissimilarity indicator. This evidence lends support to our argument that firms' will make greater commitment towards sustainable initiatives when there is larger *Chair-CEO* age gap.

The results in Table 5 show that *Chair-CEO gender* and *Chair-CEO industry experience* differences are positively and significantly associated with *ESGP* at the 1% level (see Columns 6 and 7), respectively. The results offer empirical support for our third hypothesis that *Chair-CEO gender* and *industry experience* differences can increase the monitoring capacity of the board. In particular, the results in Table 5 show that gender and industry experience differences between the Chair and the CEO have the greatest impact on *ESGP*. The implication is that in firms where the positions of Chair and CEO are occupied by people of different gender and industry experience, the commitment of the firms to sustainable business initiatives is significantly enhanced.

The regression results in Columns 1 to 7 in Table 6 test the impact of *Chair-CEO* dissimilarity variables on the environmental performance (*ENVP*) of firms. The coefficient on *Chair-CEO* diversity is positive and statistically significant at the 5% level (see Column 1), as predicted. This evidence is consistent with the earlier evidence and provides further empirical support for *H1a* that *Chair-CEO* diversity is a key driver of environmental performance. The evidence further corroborates our expectation that, the greater the *Chair-CEO* diversity, the higher the environmental performance of firms. Concerning the Chair and CEO age difference measures,

similarly, we observe that the coefficient on *Chair-CEO age difference* and *older Chair* are positive and significant. This provides empirical support for *H1b*. The results indicate that *Chair-CEO age dissimilarity* can improve firms' environmental performance. By contrast, we do not find any significant association between *younger Chair* and *ENVP*. This evidence provides empirical support for *H1c* in that older Chair has greater and significant impact on *ENVP* than younger Chair (weak association). The results in Table 6 also reveal that *Chair-CEO age gap 20* has a positive and significant impact on *ENVP* of firms at 1% level in Column 4. This evidence provides further empirical support for our second hypothesis that a larger generational age gap between the Chair and CEO can enhance the environmental performance of firms. More importantly, the coefficient (1.526) on *age gap 20* is higher than the other *Chair-CEO age difference* variable, thus offering strong empirical support for our second hypothesis. Concerning the impact of *Chair-CEO* gender and industry experience difference, the results reported in Table 6 show beneficial relationships. Specifically, the coefficient on gender and industry experience differences is positive and significant at 1% levels in Columns 6 and 7, respectively. The findings indicate that cognitive difference between the Chair and the CEO strengthens the monitoring power of the board when there is gender difference between the two. This is also consistent with our argument that *Chair-CEO* gender and industry experience dissimilarity can boost the cognitive conflicts ensuring superior monitoring and proper alignment of corporate executives' interests with sustainable business initiatives. In summary, our third hypothesis is strongly supported.

Table 7 presents the estimation results of the impact of *Chair-CEO* dissimilarity on the actual greenhouse gases reduction performance (*GHGP*) of the firms. The results in the table reveal that *Chair-CEO* diversity has as a positive relationship with the *GHGP* of a firm, implying that *H1a* is supported. More importantly, out of the seven *Chair-CEO* dissimilarities, *Chair-CEO* diversity has the greatest impact on firms' actual reduction of *GHGs* emissions into the environment. This suggests that the combined effect of *Chair-CEO* diversity can act as a critical governance tool that can set the pace for greater commitment towards protecting the planet. The study also observes that the coefficient on *Chair-CEO age difference*, *older Chair* and *younger Chair* are positive and significant at the 1% levels (see Columns 2, 4 and 5), respectively. These findings offer strong empirical support to *H1b* that *Chair-CEO age* dissimilarity can have a beneficial impact in limiting the emission of actual greenhouse gases into the environment. The results indicate that there is beneficial effect of *Chair-CEO age* dissimilarity on *GHGP*. Likewise, the coefficient on older Chair (1.294) is higher in magnitude than the coefficient on younger Chair (0.425). Hence, *H1c* is empirically supported. The findings indicate that older Chair make greater commitment towards reducing *GHGs* emission than younger Chair.

In Column 3 of Table 7, the coefficient on the Chair-CEO generational gap (*Chair-CEO age gap 20*) is positive and significant at the 1% level, as expected. This findings show that the larger the age difference, the greater the firms' *GHGP*. This offers further empirical support for our second hypothesis. In addition, the coefficient on *age gap 20* (0.237) is much higher than the other Chair and CEO *age* dissimilarity, implying that a larger age difference between the Chair and CEO, the greater reduction in actual *GHGs* emission. Results for *Chair-CEO* gender and industry experience dissimilarity reported in Columns 6 and 7 show positive and significant coefficients on gender and industry experience difference at the 1% level, respectively. These imply hypothesis 3 is accepted. Our evidence corroborates the findings of prior studies that observe that greater age difference between the Chair and the CEO can induce cognitive conflict, thus ensuring effective monitoring by the board (Zhu et al., 2021; Zhou et al., 2019; Goergen et al., 2015).

We now turn to the regression results for actual CO_2 emission reduction performance (CO_2P) as reported in Table 8. The results shown in Table 8 provide support for *H1a* in that *Chair-CEO* diversity has a positive and significant effect on CO_2P. In addition, among all the *Chair-CEO* dissimilarities analysed, *Chair-CEO diversity* has the greatest beneficial effect on firms' actual reduction CO_2 emissions. This suggests that firms with greater *Chair-CEO* diversity are associated with greater reduction in CO_2 emissions. The results highlight the important role of *Chair-CEO* diversity on CO_2P. The findings suggest that diversity between the Chair and the CEO increases the cognitive conflict between them. Our evidence corroborates the argument that cognitive conflict between the Chair and the CEO improves the divergence of interest, which increases the monitoring role of the board to some extent (Zhu et al., 2021; Zhou et al., 2019). This allows the board to make greater commitment towards long-term sustainable value creation by improving operational efficiency which can reduce the emission of CO_2 in to the environment.

We also report positive and significant link between the *Chair-CEO age gap 20* and CO_2P at the 1% level in Column 4 of Table 8. This evidence offers stronger empirical support for hypothesis 2. We fine no significant association between Chair-CEO age difference and CO_2P, implying that *H1b* is not empirically supported. These findings demonstrate that only *age gap 20* leads to actual reduction in CO_2 emission in the firms. The coefficient on older Chair and younger Chair is positive and significant at the 5% and 10% levels (see Columns 4 and 5), respectively. The results offer empirical support to *H1b*. By contrast, the coefficient (1.082) on younger Chair is greater than the coefficient (0.542) on older Chair, indicating that *H1c* is rejected. In addition, the findings reported in Table 8 show that the coefficient on the *Chair-CEO* gender and industry experience difference is positive and statistically significant at 1% levels, thus indicating that hypothesis 3 is empirically supported. The evidence provides empirical support echoing prior studies that document the beneficial impact of gender on the carbon emission reduction performance of firms (Konadu et al., 2022).

Table 9 provides the regression results relating to the impact of different *Chair-CEO* dissimilarity on self-reported *GHGs* reduction performance (*SGRP*). Column 1 shows the estimated results for the combined effect of *Chair-CEO* diversity on the *SGRP*. It is evident that *Chair-CEO* diversity has a positive and significant impact on S*GRP*. The results in the table show that *Chair-CEO* diversity has the lowest coefficient among all the *Chair-CEO* dissimilarity variables. More importantly, the coefficient (0.124) on *Chair-CEO* diversity in Table 9 is lower than those reported in Table 7 (1.808) and Table 8 (1.417) for *GHGP* and CO_2P, respectively. The evidence is contrary to the expectation of *H1a*. However, it suggests that, in more *Chair-CEO* diverse boards, the increase in cognitive conflict between the Chair and CEO leads to a reduction in the tendency for the firm to report superior performance in *GHGs* reduction initiatives. Crucially, our results also indicate that *Chair-CEO* diversity leads to substantial commitments to reduce actual *GHGs* emissions.

It is apparent that all the individual types of *Chair-CEO* dissimilarity measures (*age difference, age gap 20, older Chair and younger Chair*) have positive and significant relationship with *SGRP*, as discussed. In addition, the results show that both *Chair-CEO* gender and industry experience differences are positively and significantly associated with *SGRP* at the 1% levels (see Columns 6 and 7), respectively.

Finally, and crucially, the reported results in Table 9 show that the positive relationship between the different types of *Chair-CEO* dissimilarity variables and the self-reported *GHGs* reduction performance (*SGRP*) are higher than the actual *GHGs* reduction performance (*GHGP* and CO_2P). This evidence lends support to legitimisation view that, Chairs and CEOs engagement in *GHGs* reduction related projects can be driven by symbolic and economic motivations (Adu et al., 2022a; Haque & Ntim, 2020). It is evident from the results in Table 9

that, the tendency for firms to declare superior *GHGs* disclosures reduces when there is a generational age gap between the Chair and the CEO as the coefficient of *Chair-CEO age gap 20* has the second lowest coefficient of 0.172 in Column 3 of Table 9. Also, the results highlight the crucial role *Chair-CEO* gender difference can play in limiting the tendency for firms to disclose superior *GHGs* initiatives as it has the third lowest coefficient of 0.232 in Column 6 of Table 9.

Overall, the main findings of our study indicate that the Chair and the CEO dissimilarity attributes are positively associated with the different measures of *SBPs*. Our findings are consistent in the actual measures of *GHGs* reduction performance as well as in the self-reported *GHGs* performance construct. Notably, we observe that the combined effect of *Chair-CEO* diversity, a generational age gap and gender differences between the Chair and the CEO are related with increased in actual *GHGs* reduction performance, and a relatively low association with self-reported *GHGs* reduction performance. This evidence is consistent with our hypothesis that cognitive conflict from a *Chair-CEO* dissimilarity such as larger difference in age, gender and industry experience can lead to effective monitoring and superior performance in sustainable initiatives, which can in turn increase *SBP*s.

4.3 Significance of Control Variables

The study report significant coefficients for several variables included in our investigations. We found positive relationship between the CG variables (board size, audit firm size and the presence of sustainability committees) and the *SBPs* measures. These findings collaborate the evidence of previous CG studies that document positive relationship between; board sizes (Adu et al., 2022a; Akbas, 2016; Walls et al., 2012); audit firm size (Adu et al., 2022a) and board level sustainability committee (Al-Shaer & Zaman, 2019; Michelon & Parbonetti, 2012), and various sustainability measures. By contrast, we find that board independence has positive but insignificant relationship with the *SBPs* measures in most of the models. The result is in line with prior studies that observe similar findings (Pucheta-Martínez et al., 2019; Lau et al., 2016; Walls & Hoffman, 2013).

5 Potential Endogeneity Concerns and Robustness Checks

As underscored in CG studies, the results of the study may be subjected to several endogeneity problems. For example, our results may be affected by omitted firm level variables. This type of endogeneity can be addressed for by using firm fixed-effects in the estimations (Zhou et al., 2019). Employing firm fixed-effects can control for firm features including image, culture or the type of firm) that may be omitted in our estimations (Haque and Ntim, 2020; Zhou et al., 2019). Accordingly, we conduct a dynamic two-step system generalized method of moments (GMM) in order to minimise the potential impact of omitted sample bias and dynamic endogeneity in our results (Blundell & Bond, 1998; Arellano & Bond, 1991). In particular, Blundell and Bond (1998) maintain that a dynamic two-step system GMM has the capacity to fix these two types of endogeneity.

Concerning the impact of *Chair-CEO* dissimilarity on *SBPs*, the GMM results reported in Table 10 are consistent with our main findings in Table 5. For example, results in Table 10 show that *Chair-CEO* dissimilarity variables are positively related to *ESGP*.

Also, the GMM results regarding the impact of *Chair-CEO* dissimilarity on the *SBPs* measures contained in Table 11 are consistent with our main findings. For example, with the exception of Column 5, all the *Chair-CEO* dissimilarity variables are positively associated with *ENVP*.

The GMM regression results in Tables 12 are also consistent with our main findings in Tables 7. The *Chair-CEO* dissimilarity variables are positively associated with the actual *GHGP*.

Also, our results in Table 13 support our findings in Table 8 as *Chair-CEO* diversity, *Chair-CEO age gap 20*, *older Chair*, *younger Chair*, *gender* and *industry experience difference* are positively and significantly associated with CO_2P.
In addition, our GMM estimation results in Tables 14 are consistent with our main findings in Table 9. The *Chair-CEO* dissimilarity variables are positively associated with the *SGRP*.
Additionally, we estimate a two-stage least squares (*2SLS*) using 1 period lag of the *Chair-CEO* dissimilarity variables as instruments. The results (for brevity, not reported but available on request) from this analysis also support our main findings. Hence we confirm that, our results were not driven by any potential endogeneity and sample selection bias issues.

6 Conclusions and Implications

Globally, the design and implementation of *SBPs* that can improve sustainable business decisions and limit *GHGs* emission continue to be a major topical issue. For instance, in the last three decades various national governments and policymakers have designed and adopted extensive initiatives that seek to global climate change by limiting *GHGs* emission to the environment. Within the UK context, this objective has been attained mainly through the 2008 climate change agreement. As a consequence, regulators and firms are progressively concentrating on these crucial climate risks with particular focus on aligning business operations with the SDGs.
A fundamental element of internal governance of companies is the role of the board who are essentially accountable to the shareholders for supervising and ensuring sustainable value creation. We maintain that diversity within the board can lead to cognitive conflicts which can positively impact on the independence of the board. It is expected that a more independent more on the basis of diversity will enable the board to effectively perform its advising and monitoring roles. Within this framework, the association between the Chair and the CEO, two important board positions, and their dealings can have a considerable impact on the decisions of the board, especially concerning their sustainable business initiatives. Particularly, age, gender and industry experience dissimilarities can lead to cognitive conflicts which can be valuable mechanism for influencing and creating *SBPs* agenda. In this study, we examine whether differences between the Chair and the CEO affect *SBPs* by employing data collected from 262 listed firms in the UK from 2009 to 2018.
We find that *Chair-CEO* diversity on the basis of gender, generational gap and industry experience differences has the greatest beneficial impact in terms of increasing firms' actual *GHGs* reduction performance and a decrease in self-reported *GHGs* performance. The study also observes that *Chair-CEO* age difference increases *SBPs*. In particular, the study observes that a generational age difference between the Chair and the CEO described as a minimum of two decades and gender differences is highly significant in increasing *SBPs*. Our study employ various measures of *SBPs* to differentiate between actual and self-reported *SBPs*. We control for board members, independence, audit firm size as well as board level sustainability committees and other firm characteristics. The study employs different specifications and estimators to assess the robustness of the findings, particularly for different endogeneity issues. The key findings remain consistent.

6.1 Implications

The findings of our study have key regulatory and policy implications. Firstly, the evidence from this research has crucial policy implications concerning the regulation of companies especially linked to the 2017 Hampton-Alexander Review regarding board diversity. The findings of our study relating to the impact of differences between the Chair and the CEO on *SBPs* lend support the above-mentioned recommendation on higher diversity within the board.

Particularly, greater diversity in the Chair and CEO role in terms of gender dissimilarity can increase *SBPs*. Our findings in the UK context may also be important to regulators and policy-makers in other countries and regions.

Crucially, the evidence of our study shows that companies can rely on self-reported *GHGs* reduction performance as a way of increasing their environmental legitimacy. Evidently, this will not be beneficial as it cannot lead to a decline in the actual emission of greenhouse gases. Therefore, policy-makers and regulators need to create more awareness among shareholders, investors, and other stakeholders with regards to the potential risks associated with climate change. This will ensure that shareholders investors, and key stakeholders will demand that firms disclose their actual *GHGs* emission reduction performance. In addition, our findings suggest that rating agencies and analysts should not focus on self-reported *GHGs* reduction initiatives but rather in rating firms, they should concentrate on the firms' actual *GHGs* reduction performance and advise stakeholders for them to make well-informed investment decisions.

6.2 Study Limitations and Future Research

The findings of our study are important and robust, however there are several potential limitations that must be acknowledged. The findings of our study relate to the impact of various Chair and CEO dissimilarity variables on *SBPs* in the UK context. Hence, our findings may not be applicable to all firms because governance structures may differ from individual countries and across regions. In view of that, future studies may investigates how differences between the Chair and CEO affect *SBPs* in a cross-country analysis. Perhaps, future research may provide additional insight on these issues by employing a sample from a developing country. Regardless of these possible limitations, our study shows the value of board diversity, especially between the Chair and CEO on firms' *SBPs* performance.

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Reference

Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. The Journal of Finance, 62(1), 217-250.

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. Journal of Financial Economics, 94(2), 291-309.

Adu, D. A. (2022a). Competition and bank risk-taking in Sub-Saharan Africa countries. SN Business & Economics, 2(7), 1-26.

Adu, D. A. (2022b). Sustainable banking initiatives, environmental disclosure and financial performance: the moderating impact of corporate governance mechanisms. Business Strategy and the Environment. https://doi.org/10.1002/bse.3033

Adu, D. A., Flynn, A., & Grey, C. (2022a). Executive compensation and sustainable business practices: the moderating role of sustainability-based compensation. Business Strategy and the Environment, 31(3), 698-736.

Adu, D.A., Al-Najjar, B., Sitthipongpanich, T. (2022b). Executive compensation, environmental performance, and sustainable banking: the moderating effect of

governance mechanisms. Business Strategy and the Environment, 1-25. https://doi.org/10.1002/ bse.2963

Akbas, H. E. (2016). The relationship between board characteristics and environmental disclosure: Evidence from Turkish listed companies. South East European Journal of Economics and Business, 11(2), 7-19.

Al-Shaer, H., & Zaman, M. (2019). CEO compensation and sustainability reporting assurance: evidence from the UK. Journal of Business Ethics, 158 (1), 233-252.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies, 58(2), 277-297.

Arfken, D. E., Bellar, S. L., & Helms, M. M. (2004). The ultimate glass ceiling revisited: The presence of women on corporate boards. Journal of Business Ethics, 50(2), 177-186.

Azman, M. I. K. B. K., & Rashid, A. B. A. (2020). Board Composition and Characteristics' Effect on the Quality of Sustainability Reporting Among Companies in Malaysia. Global Business and Management Research, 12(4).

Baboukardo, D. (2018). The valuation relevance of environmental performance revisited: the moderating role of environmental provisions. British Accounting Review, 50 32-47.

Baboukardos, D. (2017). Market valuation of greenhouse gas emissions under a mandatory reporting regime: evidence from the UK. Accounting Forum, 41,3, 221-233.

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: does the composition of the top team make a difference? Strategic Management Journal, 10(S1), 107-124.

Bilimoria, D., & Piderit, S. K. (1994). Board committee membership: effects of sex-based bias. Academy of Management Journal, 37(6), 1453-1477.

Birindelli, G., Iannuzzi, A. P., & Savioli, M. (2019). The impact of women leaders on environmental performance: evidence on gender diversity in banks. Corporate Social Responsibility and Environmental Management, 26(6), 1485-1499.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), 115-143.

Boiral, O. (2013). Sustainability reports as simulacra? A counter account of A and A + GRI reports. Accounting, Auditing and Accountability Journal, 26, (7), 1036-1071.

Brahma, S., Nwafor, C., & Boateng, A. (2021). Board gender diversity and firm performance: The UK evidence. International Journal of Finance and Economics, 26(4), 5704-5719.

Brammer, S., and Pavelin, S. (2006). Voluntary environmental disclosures by large UK companies. Journal of Business Finance and Accounting, 33 (7-8), 1168-1188.

Brooks, C. & Schopohl, L. (2019). Special issue: Green accounting and finance. British Accounting Review. Forthcoming.

Bucciol, A., & Miniaci, R. (2011). Household portfolios and implicit risk preference. Review of Economics and Statistics, 93(4), 1235-1250.

Burt, R. S. (1991). Age as a Structural Concept. Social Networks 19:355-73

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. Corporate Governance: An International Review, 18(5), 396-414.

Chevalier, J., & Ellison, G. (1999). Career concerns of mutual fund managers. The Quarterly Journal of Economics, 114(2), 389-432.

Cordeiro, J. J. & Sarkis, J. (2008). Does explicit contracting effectively link CEO compensation to environmental performance? Business Strategy and the Environment, 17, 304-317.

Cordeiro, J. J., Profumo, G., & Tutore, I. (2020). Board gender diversity and corporate environmental performance: the moderating role of family and dual-class majority ownership structures. Business Strategy and the Environment, 29(3), 1127-1144.

Crifo, P., Escrig-Olmedo, E., & Mottis, N. (2019). Corporate governance as a key driver of corporate sustainability in France: the role of board members and investor relations. Journal of Business Ethics, 159(4), 1127-1146.

Cucari, N., Esposito De Falco, S., & Orlando, B. (2018). Diversity of board of directors and environmental social governance: evidence from Italian listed companies. Corporate Social Responsibility and Environmental Management, 25, (3): 250-266.

Diamantopoulos, A., Schlegelmilch, B. B., Sinkovics, R. R., & Bohlen, G. M. (2003). Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. Journal of Business Research, 56, 465- 480.

Dumas, T. L., Phillips, K. W., & Rothbard, N. P. (2013). Getting closer at the company party: Integration experiences, racial dissimilarity, and workplace relationships. Organization Science, 24(5), 1377-1401.

Eisenberg, T., Sundgren, S., & Wells, M. T. (1998). Larger board size and decreasing firm value in small firms. Journal of Financial Economics, 48(1), 35-54.

Eisenhardt, K. M., & Schoonhoven, C. B. (1990). Organizational growth: Linking founding team, strategy, environment, and growth among US semiconductor ventures, 1978-1988. Administrative Science Quarterly, 504-529.

Elsayih, J., Datt, R., & Tang, Q. (2021). Corporate governance and carbon emissions performance: empirical evidence from Australia. Australasian Journal of Environmental Management, 28(4), 433-459.

Elmagrhi, M. H., Ntim, C. G., Elamer, A. A., & Zhang, Q. (2019). A study of environmental policies and regulations, governance structures, and environmental performance: the role of female directors. Business Strategy and the Environment, 28(1), 206-220.

Esa, E., & Ghazali, N. A. M. (2012). Corporate social responsibility and corporate governance in Malaysian government-linked companies. Corporate Governance: The International Journal of Business in Society.

Estélyi, K. S., & Nisar, T. M. (2016). Diverse boards: Why do firms get foreign nationals on their boards? Journal of Corporate Finance, 39, 174-192.

Ferris, G. R., Judge, T. A., Chachere, J. G., & Liden, R. C. (1991). The age context of performance-evaluation decisions. Psychology and Aging, 6(4), 616.

Fracassi, C., & Tate, G. (2012). External networking and internal firm governance. The Journal of Finance, 67(1), 153-194.

Gadenne, D. L., Kennedy, J., & McKeiver, C. (2009). An empirical study of environmental awareness and practices in SMEs. Journal of Business Ethics, 84, 45-63.

Giannarakis, G. (2014). The determinants influencing the extent of CSR disclosure, International Journal of Law and Management, 56, 5:393-416.

Goergen, M., Limbach, P., & Scholz, M. (2015). Mind the gap: The age dissimilarity between the chair and the CEO. Journal of Corporate Finance, 35, 136-158.

Grey, C., Flynn, A., & Donnelly, R. (2020). Management compensation contracts and distribution policies in the US technology sector. International Review of Financial Analysis, 67, 101403.

Grey, C., Stathopoulos, K., & Walker, M. (2013). The impact of executive pay on the disclosure of alternative earnings per share figures. International Review of Financial Analysis, 29, 227-236.

Gyapong, E., Monem, R. M., & Hu, F. (2016). Do Women and Ethnic Minority Directors Influence Firm Value? evidence from Post-Apartheid South Africa. Journal of Business Finance and Accounting, 43(3-4), 370-413.

Hafsi, T., & Turgut, G. (2013). Boardroom diversity and its effect on social performance: Conceptualization and empirical evidence. Journal of Business Ethics, 112, 463- 479.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: the organization as a reflection of its top managers. Academy of Management Review, 9, 193– 206

Haque, F., & Ntim, C. G. (2018). Environmental policy, sustainable development, governance mechanisms and environmental performance. Business Strategy and the Environment, 27 (3), 415-435.

Haque, F., & Ntim, C. G. (2022). Do corporate sustainability initiatives improve corporate carbon performance? Evidence from European firms. Business Strategy and the Environment.

Haque, F., & Ntim, C. G. (2020). Executive compensation, sustainable compensation policy, carbon performance and market value. British Journal of Management, 31 (3), 525-546.

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface-and deep-level diversity on work group cohesion. Academy of Management Journal, 41(1), 96-107.

Harrison, D. A., & Klein, K. J. (2007). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. Academy of management review, 32(4), 1199-1228.

Hasan, I., Kobeissi, N., & Song, L. (2014). Corporate governance, investor protection, and firm performance in MENA countries. Middle East Development Journal, 6(1), 84-107.

Hassan, R., Marimuthu, M., & Johl, S. K. (2015). Diversity, corporate governance and implication on firm financial performance. Global Business and Management Research, 7(2), 28.

He, R., Zhou, M., Liu, J., & Yang, Q. (2021). Female directors and carbon information disclosure: evidence from China. Discrete Dynamics in Nature and Society, 2021.

Hitt, M. A., & Tyler, B. B. (1991). Strategic decision models: Integrating different perspectives, Strategic Management Journal, 12, 327-351.

Hong, H., Kubik, J. D., & Solomon, A. (2000). Security analysts' career concerns and herding of earnings forecasts. The Rand Journal of Economics, 121-144.

Hwang, B. H., & Kim, S. (2009). It pays to have friends. Journal of Financial Economics, 93(1), 138-158.

Ibrahim, A. H., & Hanefah, M. M. (2016). Board diversity and corporate social responsibility in Jordan. Journal of Financial Reporting and Accounting, 14, 279-298.

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. The Journal of Finance, 48(3), 831-880.

Katz, R. (1982). The effects of group longevity on project communication and performance. Administrative Science Quarterly, 81-104.

Kossinets, G., & Watts, D. J. (2009). Origins of homophily in an evolving social network. American journal of sociology, 115(2), 405-450.

Konadu, R., Ahinful, G. S., Boakye, D. J., & Elbardan, H. (2022). Board gender diversity, environmental innovation and corporate carbon emissions. Technological Forecasting and Social Change, 174, 121279.

Kyaw, K., Treepongkaruna, S., & Jiraporn, P. (2022). Board gender diversity and environmental emissions. Business Strategy and the Environment.

Lazarsfeld, P. F., & Robert K. M. (1954). Friendship as a social process: a substantive and methodological analysis." Pp. 18–66 in Freedom and Control in Modern Society, edited by Monroe Berger, Theodore Abel, and Charles H. Page. New York: Van Nostrand.

Lau, C., Lu, Y. & Q. Liang, Q. (2016). Corporate social responsibility in China: a corporate governance approach, Journal of Business Ethics, 136 (1) (2016), 73-87.

Lee, J., Lee, K. J., & Nagarajan, N. J. (2014). Birds of a feather: value implications of political alignment between top management and directors. Journal of Financial Economics, 112(2), 232-250.

Liere, K. D. V., & Dunlap, R. E. (1980). The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. Public Opinion Quarterly, 44, 181–197.

Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. The Business Lawyer, 59-77.

Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China? Journal of Corporate Finance, 28 169-184.

Lott, A. J., & Lott, B. E. (1961). Group cohesiveness, communication level, and conformity. The Journal of Abnormal and Social Psychology, 62(2), 408.

Lu, J., & Herremans, I. M. (2019). Board gender diversity and environmental performance: An industries perspective. Business Strategy and the Environment, 28(7), 1449-1464.

Ludwig, P., & Sassen, R. (2022). Which internal corporate governance mechanisms drive corporate sustainability? Journal of Environmental Management, 301, 113780.

Magd, H., & Karyamsetty, H. (2021). Assessing the Significance of Corporate Social Responsibility Actions to Achieve Sustainable Business and Organizational Performance during the COVID-19 Pandemic in Oman. Global Business & Management Research, 13(3).

Marsden, P.V. (1987). Core discussion networks of Americans. American Sociological Review, 122-131.

Mardini, G. H., & Lahyani, F. E. (2021). Impact of foreign directors on carbon emissions performance and disclosure: empirical evidence from France. Sustainability Accounting, Management and Policy Journal.

Martínez, M. D. C. V., Martín-Cervantes, P. A., & del Mar Miralles-Quirós, M. (2022). Sustainable development and the limits of gender policies on corporate boards in Europe. A comparative analysis between developed and emerging markets. European Research on Management and Business Economics, 28(1), 100168.

McPherson, J. M., & Smith-Lovin, L. (1987). Homophily in voluntary organizations: Status distance and the composition of face-to-face groups. American sociological review, 370-379.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. Annual Review of Sociology, 27(1), 415-444.

Michelon, G., & Parbonetti, A. (2012). The effect of corporate governance on sustainability disclosure. Journal of Management and Governance, 16(3), 477-509.

Mohmed, A., Flynn, A., & Grey, C. (2019). The link between CSR and earnings quality: evidence from Egypt. Journal of Accounting in Emerging Economies, 1, 1-20.

Murray, A. I. (1989). Top management group heterogeneity and firm performance. Strategic Management Journal, 10(S1), 125-141.

Nguyen, T. H., Elmagrhi, M. H., Ntim, C. G., & Wu, Y. (2021). Environmental performance, sustainability, governance, and financial performance: evidence from heavily polluting industries in China. Business Strategy and the Environment, 30(5), 2313-2331.

Ntim, C. G., & Soobaroyen, T. (2013). Corporate governance and performance in socially responsible corporations: New empirical insights from a Neo-Institutional framework. Corporate Governance: An International Review, 21(5), 468-494.

Nuber, C., & Velte, P. (2021). Board gender diversity and carbon emissions: European evidence on curvilinear relationships and critical mass. *Business Strategy and the Environment*, *30*(4), 1958-1992.

O'Reilly, C., Caldwell, D.F. & Barnett, W.P. (1989). Wok group demography, social integration, and turnover. Administrative Science Quarterly, 34, 21-37.

Orazalin, N., & Baydauletov, M. (2020). Corporate social responsibility strategy and corporate environmental and social performance: the moderating role of board gender diversity. Corporate Social Responsibility and Environmental Management, 27(4), 1664-1676

Pelled, L. H., Eisenhardt, K. M., & Xin, K. R. (1999). Exploring the black box: An analysis of work group diversity, conflict and performance. Administrative Science Quarterly, 44(1), 1-28.

Peni, E. (2014). CEO and Chairperson characteristics and firm performance. Journal of Management and Governance, 18(1), 185-205.

Pfeffer, J (1983). Organizational demography. In L.L. Cummings, Barry M. Staw (Eds.), Research in organizational behaviour (Vol 5, pp. 299-357). Greenwich, CT: JAI Press.

Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. Academy of Management Journal, 58(5), 1546-1571.

Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. Business and Society, 50, 189-223.

Prabowo, M. A., Iswaningtyas, A., Syofyan, E., Idris, I., Mulazid, A. S., & Habbe, A. H. (2017). Board of directors and CSR disclosure in Indonesian banking industry: does education matter? International Journal of Trade and Global Markets, 10(4), 322-338.

Pucheta-Martínez, M.C., Bel-Oms, I. & Nekhili, M (2019).The contribution of financial entities to the sustainable development through the reporting of corporate social responsibility information Sustainable Development, 27 (3) (2019), 388-400.

Rjiba, H., & Thavaharan, T. (2022). Female Representation on Boards and Carbon Emissions: International Evidence. Finance Research Letters, 103079.

Rahman, N. R. A., Rasid, S. Z. A., & Basiruddin, R. (2020). The Trend of Voluntary Carbon Disclosure Practices in Malaysia: Substantive or Symbolic?. Global Business & Management Research, 12(4).

Qian, W., & Schaltegger, S. (2018). Revisiting carbon disclosure and performance: legitimacy and management views, British Accounting Review, 49, 365-379.

Rhodes, S. R. (1983). Age-related differences in work attitudes and behavior: A review and conceptual analysis. Psychological Bulletin, 93(2), 328.

Saad, M. M., Gaber, H. R., & Labib, A. A. (2021). The Impact of CSR on Employees' Engagement. A Study on SMEs in Egypt. Global Business and Management Research, 13(3).

Sarhan, A. A., Ntim, C. G., & Al-Najjar, B. (2019). Board diversity, corporate governance, corporate performance, and executive pay. International Journal of Finance and Economics, 24(2), 761-786.

Serfling, M. A. (2014). CEO age and the riskiness of corporate policies. Journal of Corporate Finance, 25, 251-273.

Shahab, Y., Ntim, C. G., & Ullah, F. (2018). The brighter side of being socially responsible: CSR ratings and financial distress among Chinese state and non-state owned firms. Applied Economics Letters, 26, (3), 1-7.

Smith, K. G., Smith, K. A., Olian, J. D., Sims Jr, H. P., O'Bannon, D. P., & Scully, J. A. (1994). Top management team demography and process: the role of social integration and communication. Administrative Science Quarterly, 412-438.

Strauss, W. & Howe, N. (1997). The fourth turning. New York: Broadway Books.

Talbot, D., & Boiral, O. (2015). Strategies for climate change and impression management: A case study among Canada's large industrial emitters. Journal of Business Ethics, 132, (2), 329-346.

Tauringana, V. & Chithambo, L. (2015). The effect of DEFRA guidance on greenhouse gas disclosure. British Accounting Review, 47, 425-444.

Taylor, R. N. (1975). Age and experience as determinants of managerial information processing and decision making performance. Academy of Management Journal, 18(1), 74-81.

Ullah, S., Ahmad, S., Akbar, S., & Kodwani, D. (2019). International evidence on the determinants of organizational ethical vulnerability. British Journal of Management, 30(3), 668-691.

Ullah, F., Jiang, P., Ntim, C. G., Shahab, Y., & Jiang, X. (2022). Female Directors' Foreign Experience and Environmental and Sustainable Performance. Asia-Pacific Journal of Financial Studies, 51(2), 169-193.

UNCTAD Trade and development report (2019). In Proceedings of the United Nations Conference on Trade and Development, New York, NY, USA.

Uwuigbe, U. N., Egbide, B. C., & Ayokunle, A. M. (2011). The effect of board size and board composition on firms corporate environmental disclosure: A study of selected firms in Nigeria. Acta Universitatis Danubius. Œconomica, 7(5).

Van der Walt, N., Ingley, C., Shergill, G. S., & Townsend, A. (2006). Board configuration: are diverse boards better boards? Corporate Governance: The International Journal of Business in Society, 6, 129-147.

Verbrugge, L. M. (1977). The Structure of Adult Friendship Choices. Social Forces 56:576-97.

Wagner, W. G., Pfeffer, J., & O'Reilly III, C. A. (1984). Organizational demography and turnover in top-management group. Administrative Science Quarterly, 74-92.

Walls, J. L., & Hoffman, A. J. (2013). Exceptional boards: Environmental experience and positive deviance from institutional norms. Journal of Organizational Behavior, 34(2), 253-271.

Walls, J. L., Berrone, P., & Phan, P. H. (2012). Corporate governance and environmental performance: Is there really a link? Strategic Management Journal, 33(8), 885-913.

Wehrmeyer, W., & McNeil, M. (2000). Activists, pragmatists, technophiles and tree huggers? Gender differences in employees' environmental attitudes. Journal of Business Ethics, 28(3).

Wellalage, N. H., & Locke, S. (2013). Corporate governance, board diversity and firm financial performance: New evidence from Sri Lanka. International Journal of Business Governance and Ethics, 8(2), 116-136.

Wiernik, B. M., Ones, D. S., & Dilchert, S. (2013). Age and environmental sustainability: a meta-analysis. Journal of Managerial Psychology.

Yamori, N., Harimaya, K., & Tomimura, K. (2017). Corporate governance structure and efficiencies of cooperative banks. International Journal of Finance and Economics, 22(4), 368-378.

Yim, S. (2013). The acquisitiveness of youth: CEO age and acquisition behavior. Journal of Financial Economics, 108 (1), 250-273.

Zainon, S., Atan, R., Ahmad, R. A. R., & Wah, Y. B. (2012). Associations between organizational specific-attributes and the extent of disclosure in charity annual returns. International Journal of Mathematical Models and Methods in Applied Sciences, 3(6), 482-489.

Zhou, Y., Kara, A., & Molyneux, P. (2019). Chair-CEO generation gap and bank risk-taking. The British Accounting Review, 51(4), 352-372.

Zhu, J., Gao, J., & Tan, H. (2021). How the CEO power and age dissimilarity shape the chair-CEO pay gap: empirical evidence from China. The North American Journal of Economics and Finance, 55, 101221.

Ziegler, A., T. Busch & V. H. Hoffmann (2011). Disclosed corporate responses to climate change and stock performance: an international empirical analysis. Energy Economics, 33, 1283-1294.

Tables

Table 1: Sector Statistics

Sectors	Total GHGs emissions	Average GHGs emissions	Firms distribution	Obs.	Percentage (%)	Carbon intensity category
Technology	8,329.12	55.53	15	148	5.73	Non-carbon intensive
Utilities	3,555,09.05	5078.701	11	108	4.20	Carbon intensive
Services	234,329.98	344.09	68	681	26.41	Non-carbon intensive
Energy	2,059,217.38	17,160.15	12	119	4.61	Carbon intensive
Industrials	151,178.36	1,503.93	30	289	11.20	Carbon intensive
Consumer Staples	181,987.06	866.61	21	210	8.14	Non-carbon intensive
Materials	1,756,452.06	6755.59	26	254	9.85	Carbon intensive
Health Care	23,824.473	264.72	9	90	3.49	Non-carbon intensive
Consumer Discretionary	261,167.80	466.37	56	541	20.97	Non-carbon intensive
Communications	36,409.74	261.94	14	139	5.39	Non-carbon intensive
Total	**5, 068405.02**		**262**	**2579**	**100.00**	

Note: The table presents sector statistics of the sample from 2008 to 2018 as collected from Bloomberg database.

Table 2. Variable definitions

Variables	Abbreviations	Descriptions	Source
Actual sustainable business practices			
ESG score	ESGP	Actual ESG score	Bloomberg
Environmental score	ENVP	Actual environmental score.	Bloomberg
Actual GHG emission reduction			
GHG emissions	GHGP	Actual GHG emissions performance as measured by the natural logarithm of total actual GHG emissions in tons.	Bloomberg
CO_2 emissions	CO_2P	Actual CO_2 emissions performance as measured by the natural logarithm of total actual CO_2 emissions in tons.	Bloomberg
Symbolic GHG reporting			
Self-reporting GHG reduction	SGRP	SGRP which is attained by adding 21 dummy variables that assess a firm's level of commitment in climate protection activities. A greater score indicates higher engagement in GHG emission-based initiatives by a firm. (Kindly refer to Appendix A1 for further specifics. Hence, a firm's score can range from a minimum of 0 (zero or no implementation of GHG reduction activities) to a highest of 21 (full or 100% establishment of activities to limit GHG emission).	Annual report
Measures of Chair-CEO dissimilarity			
Chair-CEO diversity	Chair-CEO diversity	Chair-CEO diversity, as measured by gender, age gap and industry experience difference. Where 1=gender difference, 0 no gender difference, 1=20 year age gap, and 0 otherwise, 1= industry experience difference, 0 otherwise). The scores are then summed to show the combined effect of Chair-CEO diversity with 3 indicating most diverse Chair-CEO firm, and 0 least diverse firm.	Annual report
Chair-CEO age difference	Age difference	The chair's age minus the CEO's age	Annual report
Chair-CEO age gender difference	Gender Difference	Equals to 1 when the Chair and the CEO have different gender, and 0 otherwise.	Annual report
Chair-CEO age gap 20	Age gap 20	Equals to 1 when the absolute Chair-CEO age difference is at least 20 years, and 0 otherwise	Annual report
Chair-CEO industry experience difference	Industry experience difference	Equals to 1 when the Chair and the CEO have worked in different industries previously, and 0 otherwise.	
Older Chairperson	Older Chair	Equals to 1 when the Chair is older than CEO, and 0 otherwise.	Annual report
Younger Chairperson	Younger Chair	Equals to 1 when the Chair is younger than CEO, and 0 otherwise.	Annual report
Corporate governance variables			
Board size	Board size	The natural logarithm of the number of board members	Annual report
Board independence	Board independence	Board independence is the percentage of independent directors	Annual report
Presence of sustainability committee	Sustainability committee	1 when sustainability committee is present, 0 otherwise	Annual report
Firm size	Firm size	The natural logarithm of total assets of a firm	EIKON database
Firm-specific control variables			
Leverage	Leverage	The ratio of total debt to total assets	EIKON database
Age	Age of the firm	The natural log of the age of the firm since inception	EIKON database
Capitalization	Capitalization	Equity capital divided by total assets	EIKON database
Audit firm size	Audit firm size	1 if a firm is audited by the big four audit firm (PricewaterCoopers, Deloitte & Touche, Ernest & Young and KPMG), 0 otherwise.	Annual report
Research and development	Research and development	Natural logarithm of research and development cost of a firm scaled by total assets	EIKON database
Time (t)		Year, 2009-2018	

Table 3. Descriptive statistics

Variable	Observations	Mean	Median	Std. Dev.	Min	Max
Panel A: Actual measures of SBPs						
ESGP (%)	2579	29.53	31.41	17.17	0.00	70.12
ENVP (%)	2579	20.71	18.75	16.67	0.00	74.42
Panel B: Actual measures of GHGs reduction						
GHGP (In)	2579	4.49	3.84	2.77	2.63	11.36
CO_2P (In)	2579	2.28	2.51	10.31	0.00	86.00
Panel C: Symbolic measure of GHGs reporting						
SGRP (absolute score)	2579	12.93	13.00	2.79	5.00	20.00
Panel D: Measures of Chair-CEO dissimilarity						
Chair-CEO diversity	2579	1.09	1.00	0.29	0.00	3.00
Age difference	2579	5.89	3.00	0.15	-11.00	33.00
Gender Difference	2579	0.04	0.00	0.21	0.00	1.00
Age gap 20	2579	0.12	0.00	0.29	0.00	1.00
Industry experience difference	2579	0.35	0.00	0.45	0.00	1.00
Older Chair	2579	0.57	1.00	0.50	0.00	1.00
Younger Chair	2579	0.03	0.00	0.18	0.00	1.00
Panel E: Control variables						
Board size	2579	9.76	9.00	2.69	4.00	24.00
Board independence (%)	2579	68.30	70.00	9.85	20.00	90.00
Sustainability committee	2579	0.70	1.00	0.46	0.00	1.00
Audit firm size	2579	0.98	1.00	0.12	0.00	1.00
Age of the firm (years)	2579	35.08	21.00	0.61	10.00	134
Firm size (In)	2579	20.38	19.84	4.93	0.00	28.62
Leverage	2579	0.22	0.28	0.24	0.00	3.29
Capitalization	2579	0.42	0.39	0.31	2.51	1.99
Research and development	2579	0.01	0.02	0.02	0.01	0.08

Note: Please see Table 2 for variable definitions.

Table 4. Correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ESGP (1)	1.00																				
ENVP (2)	0.46	1.00																			
GHGP (3)	0.53*	0.52*	1.00																		
CO2P (4)	0.37*	0.36*	0.54*	1.00																	
SGRP (5)	0.57*	0.41*	0.51*	0.35*	1.00																
CHAIR-CEO DIVERSITY (6)	0.18*	0.07*	0.02*	0.01*	0.03*	1.00															
AGE DIFF (7)	0.12*	0.09*	0.07*	0.05	0.14*	0.02	1.00														
GENDER DIFFERENCE (8)	0.23*	0.24*	0.25*	0.08*	0.24*	0.08	0.05*	1.00													
AGE CAP 20 (9)	0.23*	0.27*	0.02*	0.08*	0.04*	0.07	0.01*	0.03	1.00												
INDUSTRY EXPERIENCE (10)	0.02*	0.03*	0.21*	0.08*	0.24*	0.05	0.03	0.02	0.09	1.00											
OLDER CHAIR (11)	0.37*	0.38*	0.17*	0.23*	0.34*	0.07	0.08*	0.05	0.01	0.02*	1.00										
YOUNGER CHAIR (12)	0.03*	0.05*	0.32*	0.10*	0.01	0.07	0.17	0.02	0.08*	0.01*	0.09*	1.00									
BOARD SIZE (13)	0.38*	0.38*	0.33*	0.21*	0.35*	-0.01	0.01*	0.18*	0.25*	0.22*	0.40*	0.08*	1.00								
BOARD INDEPENDENCE (14)	0.08*	0.07	0.18	0.09*	0.07	0.01	0.04	0.22	-0.10*	-0.22	0.15	-0.04	0.08*	1.00							
SUSTAINABILITY COMMITTEE (15)	0.15*	0.20*	0.04*	0.05*	0.01*	-0.17	0.05	-0.30	0.04*	0.12	-0.05	0.11*	0.09	0.02	1.00						
AUDIT FIRM SIZE (16)	0.02*	0.06*	0.04*	0.02*	0.02*	-0.01*	0.11	0.05	0.06	0.03	0.03	-0.05	0.01	0.03	0.31	1.00					
AGE OF THE FIRM (17)	0.08*	0.09*	0.05*	0.07*	0.07*	-0.09	0.08*	0.07*	0.08*	0.18*	0.04	-0.01	0.06*	0.02	0.02	0.09*	1.00				
FIRM SIZE (18)	0.46*	0.43*	0.36*	0.26*	0.43*	-0.05*	-0.02	0.20	0.32	0.30*	0.35*	-0.02	0.19*	0.28*	0.27*	0.08	0.40*	1.00			
LEVERAGE (19)	-0.15*	-0.16*	-1.19*	-0.04	-0.15*	-0.07	0.07*	0.03*	0.07	0.05	0.07	-0.03	0.08*	-0.05	-0.04	0.02	0.05	0.04	1.00		

CAPITALIZATION (20)	-0.18*	-0.16*	-0.23*	-0.04	-0.17*	-0.06	0.05*	-0.15*	-0.20*	-0.14	-0.22*	-0.02	-0.12	-0.19*	-0.17	0.08	-0.23	0.07	0.04	1.00
RESEARCH & DEVELOPMENT (21)	0.07*	0.07*	0.05*	0.19*	0.08*	0.01*	-0.14	0.33*	0.08	0.04*	-0.01	0.02*	-0.11	0.06	-0.05	0.03	-0.21	0.06*	0.08	-0.09	1.00

Notes:* indicates statistical significance at either 1%, 5% or 10% level. Please we used a single "*" to represent 1%, 5% or 10% because of space limitation. Please see Table 2 for full variable definitions.

Table 5: The effect of the various types of Chair-CEO dissimilarity measures on the actual ESG performance scores

Dependent variable	ESGP	ESGP	ESGP	ESGP	ESGP	ESGP	ESGP
Independent variables							
Chair-CEO diversity	0.279***						
	(0.794)						
Age difference		0.112***					
		(0.031)					
Age gap 20			0.689***				
			(0.993)				
Older Chair				3.123***			
				(0.477)			
Younger Chair					1.753		
					(1.275)		
Gender Difference						4.276***	
						(1.111)	
Industry experience difference							10.365***
							(2.115)
Board size	3.584***	3.211***	3.540***	2.786***	3.554***	3.976***	3.574***
	(0.934)	(0.936)	(0.938)	(0.933)	(0.932)	(0.936)	(0.928)
Board independence	0.019	0.018	0.020	0.012	0.019	0.019	0.014
	(0.023)	(0.024)	(0.024)	(0.023)	(0.024)	(0.023)	(0.023)
Sustainability committee	0.693**	0.696**	0.667*	0.642*	0.671**	0.751**	0.807***
	(0.416)	(0.415)	(0.417)	(0.413)	(0.417)	(0.415)	(0.415)
Audit firm size	4.275***	4.300**	4.337**	5.199**	4.362**	4.123**	4.126**
	(1.934)	(1.929)	(1.937)	(1.923)	(1.934)	(1.929)	(1.925)
Age of the firm	3.200***	3.089***	3.193***	2.928***	3.193***	3.131***	3.206***
	(0.318)	(0.318)	(0.318)	(0.318)	(0.318)	(0.317)	(0.316)
Firm size	0.705***	0.705***	0.698***	0.673***	0.704***	0.694***	0.688***
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
Leverage	-1.993**	-2.198**	-1.825*	-2.178***	-2.048**	-2.037**	-2.200**
	(1.213)	(1.211)	(1.219)	(1.203)	(1.213)	(1.209)	(1.208)
Capitalization	-0.753	-0.756	-0.371	-0.598	-0.588	-0.708	-0.598
	(0.939)	(0.936)	(0.943)	(0.928)	(0.937)	(0.934)	(0.932)
Research and development	4.697***	4.198***	3.466***	4.116***	5.505***	3.793***	2.363***
	(2.155)	(2.093)	(2.256)	(2.020)	(2.100)	(2.069)	(2.039)
Constant	-2.713***	-2.811***	-5.331***	-3.120***	-3.355***	-3.883***	-3.017**
	(3.769)	(3.674)	(3.614)	(3.649)	(3.679)	(3.671)	(4.233)
No of observations	2579	2579	2579	2579	2579	2579	2579
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.555	0.558	0.553	0.563	0.556	0.558	0.560

Notes: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively with robust standard errors reported in parentheses. Table 2 fully defines all the variables used.

Table 6: The effect of the various types of Chair-CEO dissimilarity measures on the actual environmental performance scores

Dependent variable	ENVP	ENVP	ENVP	ENVP	ENVP	ENVP	ENVP
Independent variables							
Chair-CEO diversity	0.123**						
	(0.870)						
Age difference		0.033*					
		(0.034)					
Age gap 20			1.526***				
			(1.088)				
Older Chair				1.970***			
				(0.525)			
Younger Chair					2.248		
					(1.394)		
Gender Difference						5.512***	
						(1.213)	
Industry experience difference							12.161***
							(2.310)
Board size	6.285***	6.165***	6.234***	5.778***	6.255***	6.798***	6.279***
	(1.021)	(1.021)	(1.024)	(1.026)	(1.020)	(1.023)	(1.015)
Board independence	0.025	0.025	0.023	0.029	0.025	0.024	0.031
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Sustainability committee	0.168**	0.169*	0.129	0.136*	0.141**	0.244**	0.303*
	(0.455)	(0.455)	(0.456)	(0.454)	(0.455)	(0.454)	(0.454)
Audit firm size	0.156**	0.167**	0.248**	0.736**	0.252**	0.055**	0.031*
	(2.115)	(2.114)	(2.115)	(2.114)	(2.114)	(2.106)	(2.103)
Age of the firm	3.064***	3.032***	3.048***	2.892***	3.048***	2.969***	3.066***
	(0.348)	(0.349)	(0.348)	(0.349)	(0.347)	(0.346)	(0.345)
Firm size	0.609***	0.609***	0.597***	0.589***	0.609***	0.595***	0.590***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)
Leverage	-1.269**	-1.327*	-0.989*	-1.385*	-1.349*	-1.335**	-1.521**
	(1.328)	(1.329)	(1.333)	(1.325)	(1.328)	(1.323)	(1.322)
Capitalization	-1.747	-1.804**	-1.461	-1.781	-1.814	-1.969	-1.819
	(1.027)	(1.026)	(1.030)	(1.021)	(1.024)	(1.021)	(1.018)
Research and development	4.248***	5.559***	6.368***	4.279***	6.646***	5.592***	5.719***
	(3.290)	(3.252)	(3.385)	(3.215)	(3.227)	(3.180)	(3.153)
Constant	-3.915***	-6.652***	-6.234***	-6.687***	-6.673***	-6.205***	-4.614**
	(3.833)	(3.936)	(3.948)	(3.923)	(3.933)	(3.919)	(4.545)
No of observations	2579	2579	2579	2579	2579	2579	2579
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.438	0.439	0.436	0.436	0.433	0.443	0.445

Notes: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively with robust standard errors reported in parentheses. Table 2 fully defines all the variables used.

Table 7: The effect of the various types of Chair-CEO dissimilarity measures on the actual GHG emission reduction performance scores

Dependent variable	GHGP	GHGP	GHGP	GHGP	GHGP	GHGP	GHGP
Independent variables							
Chair-CEO Diversity	1.808***						
	(0.165)						
Age difference		0.015***					
		(0.006)					
Age gap 20			0.237***				
			(0.207)				
Older Chair				1.294***			
				(0.265)			
Younger Chair					0.425***		
					(0.100)		
Gender Difference						0.892***	
						(0.232)	
Industry experience difference							1.556***
							(0.442)
Board size	2.8487***	2.795***	2.834***	2.737***	2.834***	2.929***	2.845***
	(0.195)	(0.195)	(0.195)	(0.195)	(0.194)	(0.195)	(0.194)
Board independence	0.010***	0.010	0.009	0.011**	0.010**	0.010**	0.011**
	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Sustainability committee	0.129**	0.129*	0.132*	0.137*	0.145**	0.117*	0.112***
	(0.087)	(0.087)	(0.087)	(0.087)	(0.086)	(0.087)	(0.087)
Audit firm size	0.467**	0.473*	0.484**	0.596*	0.523**	0.437**	0.447*
	(0.404)	(0.403)	(0.404)	(0.403)	(0.402)	(0.403)	(0.403)
Age of the firm	0.341***	0.327***	0.343***	0.306***	0.332***	0.328***	0.343***
	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)
Firm size	0.113***	0.113***	0.112***	0.109***	0.113***	0.111***	0.111***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)
Leverage	-0.569	-0.595**	-0.538*	-0.593**	-0.614**	-0.577**	-0.598**
	(0.253)	(0.253)	(0.254)	(0.252)	(0.252)	(0.252)	(0.253)
Capitalization	-0.961***	-0.985	-0.916	-0.963	-0.999*	-0.991**	-0.964
	(0.196)	(0.195)	(0.196)	(0.194)	(0.194)	(0.195)	(0.195)
Research and development	2.975***	3.252***	2.396***	3.534***	3.307***	2.503***	2.816***
	(2.539)	(2.529)	(2.559)	(2.523)	(2.516)	(2.521)	(2.520)
Constant	-9.875***	-9.730***	-9.696***	-9.771***	-9.726***	-9.860***	-8.235**
	(0.770)	(0.751)	(0.754)	(0.749)	(0.748)	(0.749)	(0.871)
No of observations	2579	2579	2579	2579	2579	2579	2579
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.409	0.416	0.414	0.419	0.420	0.418	0.418

Notes: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively with robust standard errors reported in parentheses. Table 2 fully defines all the variables used.

Table 8: The effect of the various types of Chair-CEO dissimilarity measures on the actual CO_2P emission reduction performance scores

Dependent variable	CO_2P	CO_2P	CO_2P	CO_2P	CO_2P	CO_2P	CO_2P
Independent variables							
Chair-CEO diversity	1.417***						
	(0.148)						
Age difference		0.001					
		(0.005)					
Age gap 20			0.542***				
			(0.185)				
Older Chair				1.082***			
				(0.236)			
Younger Chair					0.986*		
					(0.089)		
Gender Difference						0.206***	
						(0.207)	
Industry experience difference							0.249***
							(0.396)
Board size	1.742***	1.725***	1.692***	1.712***	1.742***	1.740***	1.720***
	(0.174)	(0.174)	(0.174)	(0.173)	(0.175)	(0.175)	(0.173)
Board independence	0.024	0.024***	0.024***	0.024***	0.024**	0.024***	0.024**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Sustainability committee	0.205**	0.205*	0.210**	0.218*	0.204**	0.202**	0.202***
	(0.078)	(0.077)	(0.077)	(0.077)	(0.077)	(0.078)	(0.078)
Audit firm size	0.496**	0.467*	0.491**	0.425*	0.492**	0.475**	0.471*
	(0.360)	(0.360)	(0.360)	(0.359)	(0.361)	(0.360)	(0.361)
Age of the firm	0.281***	0.268***	0.278***	0.279***	0.262***	0.273***	0.270***
	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)
Firm size	0.002***	0.002***	0.002***	0.002***	0.003***	0.001***	0.002***
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Leverage	-0.313**	-0.294**	-0.305*	-0.337**	-0.291*	-0.299**	-0.302*
	(0.225)	(0.226)	(0.227)	(0.225)	(0.226)	(0.226)	(0.226)
Capitalization	-1.321	-1.279	-1.299	-1.320	-1.280*	-1.291	-1.284
	(0.174)	(0.174)	(0.175)	(0.174)	(0.174)	(0.174)	(0.174)
Research and development	0.242***	0.923***	0.142**	0.502***	1.023**	0.967***	0.892***
	(2.273)	(2.270)	(2.294)	(2.258)	(2.269)	(2.266)	(2.265)
Constant	-5.918***	-5.496***	-2.924***	-5.444***	-5.496***	-5.510***	-5.237**
	(0.701)	(0.686)	(0.673)	(0.683)	(0.686)	(0.686)	(0.792)
No of observations	2579	2579	2579	2579	2579	2579	2579
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.345	0.344	0.346	0.419	0.344	0.344	0.344

Notes: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively with robust standard errors reported in parentheses. Table 2 fully defines all the variables used.

Table 9**:** The impact of the various types of Chair-CEO dissimilarity measures on self-reporting greenhouse gases reduction performance score

Dependent variable	SGRP	SGRP	SGRP	SGRP	SGRP	SGRP	SGRP
Independent variables							
Chair-CEO diversity	0.124***						
	(0.626)						
Age difference		8.260***					
		(2.271)					
Age gap 20			0.172***				
			(0.063)				
Older Chair				4.050***			
				(2.607)			
Younger Chair					5.300***		
					(0.979)		
Gender Difference						0.232***	
						(0.068)	
Industry experience difference							2.052***
							(0.036)
Board size	7.354***	7.551***	7.210***	7.731***	6.4317***	7.000***	7.705***
	(1.510)	(1.915)	(1.916)	(1.907)	(1.913)	(1.917)	(1.917)
Board independence	0.010	0.015	0.013	0.013**	0.002*	0.011	0.015**
	(0.049)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.049)
Sustainability committee	0.935*	1.049*	0.948*	0.886*	0.848*	0.852*	0.873***
	(0.804)	0.850	(0.850)	(0.852)	(0.847)	(0.850)	(0.853)
Audit firm size	6.478**	7.163**	7.502*	7.651*	8.030**	7.539**	7.610**
	(3.554)	(3.943)	(3.947)	(3.952)	(3.940)	(3.943)	(3.957)
Age of the firm	5.032***	5.890***	5.856***	6.003***	5.566***	5.807***	6.005***
	(0.551)	(0.649)	(0.652)	(0.649)	(0.651)	(0.651)	(0.651)
Firm size	1.304***	1.324***	1.345***	1.344***	1.291***	1.341***	1.327***
	(0.106)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
Leverage	-3.440**	-3.538**	-3.752**	-3.583**	-3.755**	-3.797**	-3.007**
	(2.383)	(2.477)	(2.482)	(2.483)	(2.469)	(2.479)	(2.494)
Capitalization	-3.252	-3.579	-3.581	-3.371	-3.349*	-3.720	-2.832
	(1.920)	(1.911)	(1.915)	(1.915)	(1.903)	(1.915)	(1.927)
Research and development	4.637***	4.228***	4.496***	3.574***	3.506***	4.387***	2.942***
	(2.844)	(2.674)	(2.742)	(2.727)	(2.631)	(2.795)	(2.041)
Constant	0.028***	0.409***	-5.083***	-4.771***	-5.513***	-4.802***	-4.953**
	(0.540)	(0.338)	(0.348)	(0 .352)	(0. 313)	(0.343)	(0.386)
No of observations	2579	2579	2579	2579	2579	2579	2579
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.522	0.524	0.523	0.522	0.527	0.519	0.519

Notes: ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively with robust standard errors reported in parentheses. Table 2 fully defines all the variables used.

Table 10: GMM estimations of the effect of the various types of Chair-CEO dissimilarity measures on the actual ESG performance scores

Dependent variable	ESGP	ESGP	ESGP	ESGP	ESGP	ESGP	ESGP
Independent variables							
Chair-CEO Diversity	0.308***						
	(0.751)						
Age difference		0.124***					
		(0.038)					
Age gap 20			0.750***				
			(0.834)				
Older Chair				3.487***			
				(0.501)			
Younger Chair					1.789		
					(1.240)		
Gender Difference						5.089***	
						(1.230)	
Industry experience difference							11.050***
							(2.081)
Board size	3.985***	4.108***	4.220***	3.580***	3.714***	4.976***	4.547***
	(0.901)	(0.857)	(0.857)	(0.889)	(0.911)	(0.895)	(0.878)
Board independence	0.017	0.021	0.025	0.021	0.025	0.022	0.020
	(0.020)	(0.023)	(0.028)	(0.025)	(0.021)	(0.027)	(0.028)
Sustainability committee	0.695**	0.704**	0.675**	0.698*	0.680**	0.699**	0.681***
	(0.408)	(0.435)	(0.429)	(0.455)	(0.423)	(0.433)	(0.428)
Audit firm size	4.385**	3.854**	4.359**	4.857**	4.442**	4.338**	4.257**
	(1.927)	(1.897)	(1.894)	(1.958)	(1.950)	(1.890)	(1.917)
Age of the firm	3.320***	3.235***	3.281***	3.854**	3.221**	3.283***	3.338**
	(0.314)	(0.354)	(0.348)	(0.332)	(0.338)	(0.351)	(0.321)
Firm size	0.737***	0.841***	0.750***	0.722***	0.760**	0.725***	0.732***
	(0.048)	(0.049)	(0.061)	(0.073)	(0.071)	(0.068)	(0.070)
Leverage	-1.810*	-1.854**	-1.789*	-1.257***	-1.805** (1.230)	-1.958**	-1.984**
	(1.227)	(1.232)	(1.230)	(1.241)		(1.241)	(1.237)
Capitalization	-0.701	-0.840	-0.421	-0.495	-0.591	-0.687	-0.512
	(0.935)	(0.957)	(0.955)	(0.911)	(0.947)	(0.958)	(0.962)
Research and development	4.720***	4.298***	3.489***	3.009***	5.221***	3.540***	2.402***
	(2.148)	(2.108)	(2.231)	(2.324)	(2.348)	(2.324)	(2.251)
Constant	-2.587***	-2.987***	-5.211***	-3.351***	-3.210***	-2.597***	-3.574**
	(3.254)	(3.432)	(3.584)	(3.702)	(3.487)	(3.544)	(3.871)
No of observations	2261	2261	2261	2261	2261	2261	2261
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR1 (Prob)	0.002	0.004	0.001	0.010	0.006	0.003	0.005
AR2 (Prob)	0.425	0.458	0.397	0.433	0.514	0.498	0.391
Hansen J (Prob)	0.593	0.707	0.511	0.591	0.623	0.670	0.572

Note: This table is based on a generalized method of moments (GMM) panel data estimator, as proposed by Arellano and Bond (1991) and Blundell and Bond (1998). The standard errors are shown in parentheses, and ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 2 fully defines all the variables used.

Table 11: GMM estimations of the effect of the various types of Chair-CEO dissimilarity measures on the actual environmental performance scores

Dependent variable	ENVP	ENVP	ENVP	ENVP	ENVP	ENVP	ENVP
Independent variables							
Chair-CEO diversity	0.128***						
	(0.892)						
Age difference		0.038**					
		(0.037)					
Age gap 20			1.684***				
			(1.120)				
Older Chair				2.084***			
				(0.541)			
Younger Chair					2.985		
					(1.387)		
Gender Difference						6.085***	
						(1.283)	
Industry experience difference							13.123***
							(2.327)
Board size	6.354***	5.019***	6.321***	6.108***	6.384***	6.840***	6.389***
	(1.083)	(1.028)	(1.039)	(1.031)	(1.039)	(1.035)	(1.038)
Board independence	0.027	0.028	0.029	0.038	0.035	0.028	0.035
	(0.025)	(0.023)	(0.028)	(0.029)	(0.030)	(0.029)	(0.028)
Sustainability committee	0.170*	0.174*	0.133*	0.138**	0.148**	0.250*	0.327**
	(0.482)	(0.480)	(0.481)	(0.481)	(0.480)	(0.430)	(0.438)
Audit firm size	0.159***	0.170**	0.354**	0.740***	0.351***	0.059**	0.031**
	(2.119)	(2.125)	(2.119)	(2.341)	(2.290)	(2.125)	(2.287)
Age of the firm	3.087**	3.128***	3.059***	3.254***	3.247***	3.140***	3.105***
	(0.350)	(0.354)	(0.352)	(0.389)	(0.392)	(0.344)	(0.355)
Firm size	0.613***	0.695***	0.621***	0.632***	0.647***	0.624***	0.620***
	(0.055)	(0.070)	(0.063)	(0.067)	(0.070)	(0.075)	(0.077)
Leverage	-1.270*	-1.349*	-1.284*	-1.391**	-1.359* (1.380)	-1.390**	-1.480**
	(1.334)	(1.348)	(1.397)	(1.348)		(1.343)	(1.339)
Capitalization	-1.765	-1.876**	-1.593	-1.871	-1.857	-1.895	-1.890 (1.027)
	(1.029)	(1.038)	(1.040)	(1.028)	(1.029)	(1.037)	
Research and development	4.250***	5.615***	6.437***	4.389***	6.681***	6.208***	6.517***
	(3.321)	(3.380)	(3.391)	(3.294)	(3.300)	(3.253)	(3.280)
Constant	-4.228***	-5.750***	-6.385***	-6.894***	-6.782***	-6.008***	-5.482**
	(0.039)	(3.840)	(3.997)	(4.391)	(3.413)	(3.981)	(4.394)
No of observations	2261	2261	2261	2261	2261	2261	2261
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR1 (Prob)	0.005	0.002	0.003	0.030	0.008	0.005	0.002
AR2 (Prob)	0.434	0.417	0.408	0.487	0.590	0.490	0.423
Hansen J (Prob)	0.509	0.620	0.539	0.596	0.688	0.681	0.562

Note: This table is based on a generalized method of moments (GMM) panel data estimator, as proposed by Arellano and Bond (1991) and Blundell and Bond (1998). The standard errors are shown in parentheses, and ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 1 fully defines all the variables used.

Table 12: GMM estimations of the effect of the various types of Chair-CEO dissimilarity measures on the actual GHG emission reduction performance scores

Dependent variable	GHGP	GHGP	GHGP	GHGP	GHGP	GHGP	GHGP
Independent variables							
Chair-CEO diversity	1.894***						
	(0.169)						
Age difference		0.028**					
		(0.010)					
Age gap 20			0.386***				
			(0.259)				
Older Chair				1.381***			
				(0.307)			
Younger Chair					0.624***		
					(0.185)		
Gender Difference						0.981***	
						(0.254)	
Industry experience difference							1.683***
							(0.495)
Board size	2.857***	2.847***	2.907***	2.851***	2.951***	2.987***	2.905***
	(0.192)	(0.209)	(0.256)	(0.252)	(0.234)	(0.201)	(0.223)
Board independence	0.011	0.025	0.018	0.023**	0.018**	0.023*	0.019**
	(0.004)	(0.008)	(0.009)	(0.010)	(0.007)	(0.008)	(0.009)
Sustainability committee	0.131**	0.135**	0.148**	0.139*	0.149**	0.121*	0.125***
	(0.085)	(0.091)	(0.090)	(0.095)	(0.092)	(0.095)	(0.092)
Audit firm size	0.472**	0.489**	0.492***	0.627*	0.630**	0.457**	0.487**
	(0.418)	(0.452)	(0.472)	(0.458)	(0.451)	(0.454)	(0.459)
Age of the firm	0.347***	0.384***	0.359***	0.342**	0.387***	0.381***	0.359***
	(0.059)	(0.069)	(0.078)	(0.093)	(0.092)	(0.094)	(0.081)
Firm size	0.118***	0.120***	0.119***	0.125***	0.138***	0.138***	0.128***
	(0.012)	(0.015)	(0.021)	(0.018)	(0.027)	(0.015)	(0.014)
Leverage	-0.565**	-0.608**	-0.629*	-0.647**	-0.689** (0.280)	-0.598**	-0.620**
	(0.259)	(0.357)	(0.308)	(0.272)		(0.291)	(0.281)
Capitalization	-0.958	-0.120	-0.893	-0.985	-1.854*	-0.840**	-0.821
	(0.197)	(0.208)	(0.220)	(0.247)	(0.228)	(0.202)	(0.218)
Research and development	3.104***	3.487***	2.654***	3.835***	3.579***	2.598***	2.954***
	(2.871)	(2.603)	(2.703)	(2.749)	(2.842)	(2.574)	(2.741)
Constant	-9.794***	-9.859***	-9.897***	-9.984***	-9.359***	-9.581***	-8.951**
	(0.765)	(0.794)	(0.814)	(0.831)	(0.851)	(0.787)	(0.894)
No of observations	2261	2261	2261	2261	2261	2261	2261
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR1 (Prob)	0.008	0.001	0.002	0.008	0.011	0.082	0.005
AR2 (Prob)	0.398	0.483	0.428	0.540	0.527	0.523	0.475
Hansen J (Prob)	0.541	0.639	0.581	0.596	0.624	0.681	0.594

Note: This table is based on a generalized method of moments (GMM) panel data estimator, as proposed by Arellano and Bond (1991) and Blundell and Bond (1998). The standard errors are shown in parentheses, and ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 2 fully defines all the variables used.

Table 13: GMM estimations of the effect of the various types of Chair-CEO dissimilarity measures on the actual CO_2P emission reduction performance scores

Dependent variable	CO_2P	CO_2P	CO_2P	CO_2P	CO_2P	CO_2P	CO_2P
Independent variables							
Chair-CEO diversity	1.480***						
	(0.151)						
Age difference		0.002					
		(0.007)					
Age gap 20			0.670***				
			(0.192)				
Older Chair				1.120***			
				(0.243)			
Younger Chair					0.908**		
					(0.091)		
Gender Difference						0.498***	
						(0.254)	
Industry experience difference							0.327***
							(0.408)
Board size	1.789***	1.857***	1.798***	1.832***	1.847***	1.805***	1.844***
	(0.173)	(0.180)	(0.185)	(0.187)	(0.185)	(0.181)	(0.183)
Board independence	0.027	0.035***	0.033***	0.029***	0.028**	0.029***	0.035**
	(0.005)	(0.009)	(0.007)	(0.007)	(0.006)	(0.008)	(0.009)
Sustainability committee	0.210*	0.3110*	0.320**	0.283*	0.209**	0.289***	0.277***
	(0.077)	(0.079)	(0.082)	(0.082)	(0.080)	(0.097)	(0.092)
Audit firm size	0.498**	0.495**	0.542**	0.490*	0.504**	0.530**	0.598**
	(0.368)	(0.374)	(0.411)	(0.362)	(0.371)	(0.422)	(0.404)
Age of the firm	0.284***	0.381***	0.325***	0.235***	0.269***	0.348***	0.322***
	(0.062)	(0.072)	(0.069)	(0.064)	(0.065)	(0.065)	(0.067)
Firm size	0.003***	0.008***	0.007***	0.008***	0.007***	0.005***	0.007***
	(0.011)	(0.014)	(0.012)	(0.010)	(0.011)	(0.014)	(0.012)
Leverage	-0.315**	-0.351**	-0.363*	-0.340**	-0.320*	-0.324**	-0.355*
	(0.227)	(0.232)	(0.239)	(0.234)	(0.232)	(0.310)	(0.239)
Capitalization	-0.322	-1.380	-1.358	-1.387	-1.321**	-1.327	-1.308
	(0.173)	(0.189)	(0.187)	(0.181)	(0.186)	(0.183)	(0.184)
Research & development	0.172***	1.250***	0.190***	0.587***	1.034**	1.256***	0.905***
	(0.272)	(2.483)	(2.342)	(2.268)	(2.300)	(2.806)	(2.378)
Constant	-5.897***	-5.893***	-3.548***	-5.584***	-5.523***	-5.529***	-5.487**
	(0.711)	(0.741)	(0.751)	(0.722)	(0.741)	(0.744)	(0.893)
No of observations	2261	2261	2261	2261	2261	2261	2261
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR1 (Prob)	0.008	0.005	0.004	0.005	0.009	0.011	0.003
AR2 (Prob)	0.384	0.416	0.329	0.527	0.485	0.554	0.428
Hansen J (Prob)	0.470	0.594	0.590	0.596	0.684	0.608	0.521

Note: This table is based on a generalized method of moments (GMM) panel data estimator, as proposed by Arellano and Bond (1991) and Blundell and Bond (1998). The standard errors are shown in parentheses, and ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 2 fully defines all the variables used.

Table 14: GMM estimations of the effect of the various types of Chair-CEO dissimilarity measures on self-reporting greenhouse gases reduction performance score

Dependent variable	SGRP	SGRP	SGRP	SGRP	SGRP	SGRP	SGRP
Independent variables							
Chair-CEO diversity	0.127***						
	(0.635)						
Age difference		8.890***					
		(2.295)					
Age gap 20			0.187***				
			(0.070)				
Older Chair				4.174***			
				(2.671)			
Younger Chair					5.434***		
					(0.987)		
Gender Difference						0.381***	
						(0.079)	
Industry experience difference							2.130***
							(0.041)
Board size	7.358***	8.405***	7.425***	7.752***	6.437***	7.108***	7.713***
	(1.530)	(2.054)	(1.980)	(1.912)	(1.927)	(1.985)	(1.920)
Board independence	0.012	0.019	0.029	0.018*	0.005*	0.013	0.019**
	(0.051)	(0.052)	(0.054)	(0.053)	(0.051)	(0.049)	(0.052)
Sustainability committee	0.938**	1.052*	0.990**	0.889**	0.855**	0.871*	0.890***
	(0.794)	0.870	(0.871)	(0.857)	(0.830)	(0.858)	(0.861)
Audit firm size	6.490**	7.281**	7.587*	7.670*	8.038**	7.544***	7.658**
	(3.549)	(4.234)	(3.952)	(3.958)	(3.949)	(3.959)	(3.979)
Age of the firm	5.084***	6.140***	5.895***	6.018***	5.573***	5.817***	6.013***
	(0.558)	(0.689)	(0.684)	(0.650)	(0.681)	(0.680)	(0.684)
Firm size	1.309***	1.384***	1.363***	1.352***	1.320***	1.352***	1.339***
	(0.108)	(0.203)	(0.135)	(0.113)	(0.115)	(0.112)	(0.118)
Leverage	-3.452**	-3.754**	-3.780**	-3.590***	-3.740**	-3.790**	-3.013**
	(2.359)	(2.530)	(2.491)	(2.489)	(2.471)	(2.512)	(2.497)
Capitalization	-3.259	-3.702	-3.687	-3.383	-3.352*	-3.735	-2.840
	(1.954)	(2.024)	(1.981)	(1.927)	(1.918)	(1.949)	(1.937)
Research & Development	4.650***	4.237***	4.504***	3.708***	3.535***	4.392***	2.958***
	(2.851)	(2.689)	(2.780)	(2.742)	(2.640)	(2.798)	(2.045)
Constant	0.031***	0.439***	-5.091***	-4.788***	-5.522***	-4.847***	-4.958**
	(0.548)	(0.342)	(0.359)	(0.359)	(0.327)	(0.353)	(0.389)
No of observations	2261	2261	2261	2261	2261	2261	2261
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR1 (Prob)	0.002	0.008	0.005	0.006	0.012	0.013	0.008
AR2 (Prob)	0.357	0.420	0.358	0.525	0.421	0.542	0.427
Hansen J (Prob)	0.574	0.551	0.547	0.596	0.630	0.650	0.583

Note: This table is based on a generalized method of moments (GMM) panel data estimator, as proposed by Arellano and Bond (1991) and Blundell and Bond (1998). The standard errors are shown in parentheses, and ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 2 fully defines all the variables used.

Appendix A1. Self-reported greenhouse gases reduction initiatives individual items (the *SGRP index*)

No.	Self-reported greenhouse gases emission reduction information	Score
1.	Is the company involved in any emission trading activities?	1 or 0
2.	Is there a report the companys' activities concerning recycling, reducing, reusing, substituting, treating or phasing out total waste, wastewater or hazardous waste?	1 or 0
3.	Is the company describing, claiming to possess or mentioning processes in place aimed at improving water efficiency?	1 or 0
4.	Is the company reporting on projects that seek to substitute, minimise or eliminate ozone-depleting substances?	1 or 0
5.	Is the company making use of renewable energy?	1 or 0
6.	Is the company reporting on activities aimed at reducing, reusing or recycling water?	1 or 0
7.	Is the company operating in ecologically friendly or sustainable sites or green offices?	1 or 0
8.	Is the company reporting on activities that seek to minimise the environmental effect on land owned, leased or managed for production activities or extractive purpose?	1 or 0
9.	Is the company reporting on activities towards reducing, reusing, substituting or phasing out toxic chemicals or substances?	1 or 0
10.	Is there a policy in place in the company towards improving the use of sustainable packaging?	1 or 0
11.	Is the company using environmental criteria (for example ISO 14000) in the choice of ithe suppliers or sourcing partners of the company?	1 or 0
12.	Is the company showing strategies towards reducing, reusing, recycling, substituting, phasing out or compensating CO2 equivalents in the production process?	1 or 0
13.	Is the company reporting or showing its readiness to terminate partneship agreements with a sourcing partner, when environmental criteria are not adhered to?	1 or 0
14.	Is there a policy in the company towards minimising the effcet of the companys' operations on biodiversity?	1 or 0
15.	Is the company reporting on activities concerning recycling, reducing, reusing or phasing out fluorinated gases including perfluorocarbons, sulfur hexafluoride or hydrofluorocarbons?	1 or 0
16.	Is the company describing, claiming to have or mention processes in place to minimise the effect of the company on biodiversity?	1 or 0
17.	Is the company reporting on activities towards to restoring or protecting native ecosystems or the biodiversity of endangered and vulnerable regions?	1 or 0
18.	Is the company reporting on activities aimed at minimising its effect on native ecosystems and biodiversity?	1 or 0
19.	Is the company evaluating the business risks and/or prospects concerning climate change?	1 or 0
20.	Is the company claiming to use balanced scorecard or key performance indicators assess the effect of the companys' operation on biodiverity?	1 or 0
21.	Is the company having prosesses in place enhance its energy efficiency?	1 or 0
	Highest score of a company	21

Source: Based on the UK 2009 guidance of the Department for Environment, Food and Rural Affairs (DEFRA, 2009) on GHG disclosures
as applied by Adu et al. (2022a) and Haque & Ntim (2020).