International Review of Financial Analysis 94 (2024) 103290

Contents lists available at ScienceDirect

International Review of Financial Analysis

journal homepage: www.elsevier.com/locate/irfa

An examination of how executive remuneration and firm performance are influenced by Chair-CEO diversity attributes

Colette Grey [a], Antoinette Flynn [a], Douglas A. Adu [b,*]

[a] Department of Accounting and Finance, Kemmy Business School, University of Limerick, Limerick, Ireland
[b] Department of Finance, Performance and Marketing, Sustainable Finance Research Group, Teesside University International Business School, Teesside University, Tees Valley, UK

ARTICLE INFO

Keywords:
Board diversity
Chair-CEO diversity
CEO Pay
Executive remuneration
Firm performance

ABSTRACT

Advancing prior research, this study investigates the effect of Chair-CEO diversity on the relationship between executive remuneration and firm performance. Employing a unique sample of 262 UK listed firms from 2009 to 2020, our findings are five-fold. First, our findings suggest that Chair-CEO diversity is negatively associated with executive remuneration levels. Second, we document a positive relationship between Chair-CEO diversity attributes and firm performance. Third, we observe that an increase in executive remuneration appears to improve firm performance. Fourth, we show that the relationship between pay, and performance is moderated/explained largely by Chair-CEO diversity attributes. Finally, we show that the predicted relationships vary across firms which have female as Chair and where female is the CEO. Our findings imply that decisions about board diversity are driven by more than just moral principles; they are also influenced by the costs and benefits that diversity might bring to the firm. Our evidence offers empirical support for upper echelons, homophily and resource dependence theories and have significant regulatory impact.

1. Introduction

Recent years have seen the emergence of two high profile areas in corporate governance- executive remuneration (ER) and board diversity. In the spotlight, especially after the global financial crisis, executive remuneration packages have been criticized as being designed to encourage excessive risk-taking (Ahmed, Atif, & Gyapong, 2021). Discernibly, the consequences of perceived excessive executive remuneration have, arguably, increased media debate and public attention about the fairness of executive remuneration, especially over the last five years (Elmagrhi & Ntim, 2022). Accordingly, to increase the accountability of executive remuneration packages, many developed countries including the United Kingdom (UK) have introduced regulatory reforms (Sarhan, Ntim, & Al-Najjar, 2019). Additionally, there is a global trend among regulators and policymakers to increase board diversity. In response, scholars have provided empirical evidence on the beneficial effect of board diversity on different corporate decisions (Adu, Flynn, & Grey, 2022a; Bugeja, Matolcsy, & Spiropoulos, 2016).

In particular, there is an increasing interest in understanding how board characteristics and their demographics, impacts the design of executive remuneration packages. Research on board diversity continues to attract a lot of attention (Adu, Flynn, & Grey, 2022a; Bugeja et al., 2016; Harakeh, El-Gammal, & Matar, 2019). Through the interaction among board members, board diversity can enhance the board's decision-making process (Zhou, Kara, & Molyneux, 2019). For instance, the degree of cognitive conflict among board members can influence the effectiveness of the monitoring role of the board (Goergen, Limbach, & Scholz, 2015). In particular, Zhou et al. (2019) maintain that the appraisal and judgment of crucial issues among board members can be improved through discussions stimulated by cognitive conflict arising from demographic differences. This notion is based on sociological theories of upper echelons and homophily. Upper echelon theory suggests that good leadership is affected by the personalities, traits and experience of those in top management, and that these influence firm behaviours and outcomes (Allison, Liu, Murtinu, & Wei, 2023; Hambrick & Mason, 1984). The theory of homophily predicts a higher level of interactions and personal relations between individuals who have similar demographic traits (McPherson, Smith-Lovin, & Cook, 2001). To that effect, upper echelons and homophily theories suggest that demographic traits can influence corporate executives understanding of different management situations and their decision-making (Hambrick & Mason, 1984). In support, resource dependence theory maintains that

* Corresponding author.
E-mail address: d.adu@tees.ac.uk (D.A. Adu).

https://doi.org/10.1016/j.irfa.2024.103290
Received 18 July 2023; Received in revised form 6 October 2023; Accepted 12 April 2024
Available online 16 April 2024

board diversity improves firms' relationship with their broad stakeholders including suppliers, customers, investors and regulators, and may enhance the reputation and value of the firm (Reguera-Alvarado, de Fuentes, & Laffarga, 2017; Sarhan et al., 2019) as well as increasing the legitimacy of the board (Adu, 2022; Wang, Song, & Zhao, 2014). The objective of this research paper is to explore the associations among executive remuneration, non-executive and executive diversity, and firm performance (FP), with a particular focus on the demographic diversity between the Chair (non-executive) and the CEO (executive) of the board of directors.

The key demographic dissimilarity measures between the Chair and CEO employed in this study are age and gender. Age demography plays a key role in the interactions within a group (Ferris, Judge, Chachere, & Liden, 1991). Prior research has established that when the people on a board are of the same generation, they experience comparable historical occurrences and societal trends (Harrison, Price, & Bell, 1998; Wagner, Pfeffer, & O'Reilly III, 1984). In this setting, they may have attended the same schools/universities and may belong to the same social organisations (such as golf clubs and Lions clubs). The inference is that they frequently have strong intellectual ties and have similar viewpoints when it comes to governing (Bantel & Jackson, 1989; Pelled, Eisenhardt, & Xin, 1999). As a result, Chairs and CEOs who are comparable in age are more likely to experience fewer cognitive conflicts, which can limit the effectiveness of the boards' monitoring role (Zhou et al., 2019). In this study, we predict that an increase in the cognitive conflicts induced by Chair-CEO age diversity can be beneficial in terms of improving boards' monitoring role, thereby impacting on the relationship ER and FP. Briefly, the ER-FP relationship maintains that corporate executives can be incentivized to achieve higher FP by linking their pay to performance-related targets (ER-FP nexus). In support, other scholars propose that Chair-CEO diversity can reduce information asymmetry and agency costs (Adu, Flynn, & Grey, 2022a; Zhu, Gao, & Tan, 2021), with beneficial effect on the ER-FP nexus. Thus, the ER-FP nexus serves as a crucial channel to mitigate agency problems in firms (Elmagrhi & Ntim, 2022).

Diversifying corporate boards on the basis of gender has also become a key global policy issue (Adams & Ferreira, 2009; Gyapong, Monem, & Hu, 2016; Zhou et al., 2019). For instance, recently there has been a focus on identifying the benefits of having females in key positions such as the Chair and CEO of firms (Brahma, Nwafor, & Boateng, 2021). In some countries, "hard (enforceable in a law court)" national laws, that specify a required number of female director representation on publicly traded firms and/or state-owned enterprises, have been implemented (e.g., Norway, Spain and France) (Terjesen, Aguilera, & Lorenz, 2015). In other countries "soft (best practice guidance)" have been made in same regard (e.g., the UK and the US) (Sarhan et al., 2019; Terjesen et al., 2015). Evidence from the Hampton-Alexander Review in 2021 on FTSE women leaders revealed a significant increase in females on the executive teams of FTSE 350 firms. Meanwhile, it has been suggested that board gender diversity may increase the alignment of interests between owners and executives (Baixauli-Soler, Lucas-Perez, Martin-Ugedo, Minguez-Vera, & Sanchez-Marin, 2016) which can influence both ER and FP (Adu, Al-Najjar, & Sitthipongpanich, 2022). Consequently, we maintain that an increase in the cognitive conflicts, stimulated by Chair-CEO gender diversity, may enhance the monitoring role of the board which can influence the ER-FP nexus.

These issues together raise three critical local and international policy questions. The first is whether the UK-style business-led voluntary approach with regards to board diversity (especially representation of women on the board) is appropriate for UK, given the key role diverse boards can play by improving the monitoring role of boards and to a large extent curbing excessive ER. Second, there is the critical local question of whether such top team diversity strategies including Chair-CEO diversity, which are progressively being adopted by the boards of listed firms in the UK, can essentially lead to improvements in FP. The third important policy question is whether the Chair-CEO diversity reforms, which are increasingly being implemented by large UK firms, has a beneficial or detrimental effect on the relationship between ER and FP of firms, and whether Chair-CEO diversity attributes can reinforce these relationships. These three crucial policy questions have been the main motivators underlying this paper.

Prompted by the growing debate on ER packages and with no prior evidence on these issues in the UK, this study sheds light on the role that Chair-CEO diversity may have on CEO Pay, total executive remuneration (TER) and FP. First, we investigate the effect of Chair-CEO age diversity and Chair-CEO gender diversity on CEO Pay and TER. Second, the study examines the relationship among Chair-CEO age and Chair-CEO gender diversity, CEO Pay, TER and FP. Finally, we explore whether Chair-CEO age and Chair-CEO gender diversity have a moderating effect on the CEO Pay-FP nexus and TER-FP relationship. The analysis draws on a multi-theoretical framework that incorporates insights from both upper echelons, homophily and resource dependence theories.

Our focus on the relationships among Chair-CEO diversity, ER and FP is motivated by three considerations. Firstly, previous research has extensively addressed the relationship between board diversity, ER and different corporate outcomes (Ahmed et al., 2021; Bugeja et al., 2016; Sarhan et al., 2019). These studies define board diversity based on measures such as director gender, ethnicity, and nationality. Importantly, existing literature is yet to explore the differential board diversity relationships, defined as Chair-CEO age and Chair-CEO gender differences, and ER. It is worth noting that, in most developed countries including the UK, the roles of the Chair and the CEO have been split to ensure that one individual does not dominate board decisions. This best practice requirement is one of the main pillars in UK corporate governance (CG) and has been enshrined in the UK CG Code through the various revisions over the years (Adu, Flynn, & Grey, 2022a). For example, the UK CG Code 2018 stipulates the appointment of an independent Chair to lead the board, and a separate role of CEO who leads the management team. By adopting this unique focus, this study responds to recent calls for board diversity research to focus on key board members such as the Chair and CEO (e.g., Adu, Flynn, & Grey, 2022a; Zhou et al., 2019).

Secondly, prior studies on the relationship between board diversity and FP have focused on (i) diversity on the basis of the director's (a person appointed to serve on the board of the firm) nationality and ethnicity (Mardiyati and Siregar, 2022; Sarhan et al., 2019); (ii) diversity on the basis of gender (Brahma et al., 2021; Liu, Wei, & Xie, 2014; Pandey, Kumar, Post, Goodell, & García-Ramos, 2022; Sarhan et al., 2019); and (iii) diversity on the basis of culture (e.g., Dodd & Zheng, 2022). These prior investigations differ from our study because these authors focus on diversity among the entire board members. For instance, the synthesis of this literature reveals that, no study has assessed how Chair-CEO age and Chair-CEO gender diversity affect FP. Our work bridges this gap in the literature and offers one of the first attempts at studying the unique relationship between board diversity on the basis of various Chair-CEO demographic attributes and FP.

Thirdly, prior studies have focused largely on the impact of Chair-CEO age diversity on ER and the Chair-CEO pay gap and have yielded mixed results (e.g., Goergen et al., 2015; Jiajun, Jing, & Hongping, 2020; Zhu et al., 2021). For example, Zhu et al. (2021) find that Chair-CEO age diversity and CEO power have opposite effects on the Chair-CEO pay gap. In addition, Jiajun et al. (2020) observe that the Chair-CEO pay gap is positively related to age dissimilarity. In a similar vein, Goergen et al. (2015) find a significantly positive effect of Chair-CEO age dissimilarity on firm value. Similarly, Jiajun et al. (2020) reveal that CEO power is negatively related to the Chair-CEO pay gap. In a related study, Zajac and Westphal (1995) show that CEOs who are able to influence the nomination process tend to appoint directors with similar demographic characteristics. Furthermore, Lee, Lee, and Nagarajan (2014), Fracassi and Tate (2012) and, Hwang and Kim (2009) provide evidence that social ties between the CEO and the other directors reduce firm value as they weaken the intensity of monitoring by

the board in the US. Nguyen (2012) discovers similar results for large French firms. While the above research focuses on CEO/director diversity and the entire board diversity as well as similarity originating from social ties, this study is concerned with demographic diversity with particular focus on the vital differences between the core board roles of the Chair and the CEO in terms of age difference, generation difference, and gender difference.

Finally, prior research that investigates how board diversity impacts the ER-FP nexus, mainly focuses on directors' gender, nationality and ethnicity (e.g., Sarhan et al., 2019), with no attention paid to Chair-CEO diversity. Meanwhile, both Chair-CEO age diversity and gender diversity have been identified to have a crucial impact on the monitoring role of the board (Adu, Flynn, & Grey, 2022a; Zhou et al., 2019; Zhu, Gao, & Tan, 2022). Thus far, no investigations have been conducted on the moderating impact of Chair-CEO diversity on the CEO Pay-FP and ER-FP relationships. Our study will bridge this clear gap in the literature.

The study makes a number of new contributions to the extant board diversity literature. First, this study is among the first to investigate the impact of Chair-CEO diversity on CEO Pay and ER. Previous research (Ahmed et al., 2021; Sarhan et al., 2019) mainly overlooked the impact of board diversity defined as Chair and CEO diversity on executive remuneration. In this paper, we maintain that attention should also be paid to the association between the two crucial decision makers of the firm Chair (non-executive director) and CEO (executive director). Our findings show that increased levels of Chair-CEO diversity are associated with enhanced internal monitoring and a reduction in CEO Pay and TER. This is achieved by examining the impact of Chair-CEO diversity on the basis of age, generational age gap, and gender on CEO Pay and TER in UK listed firms. These three Chair-CEO diversity attributes have been selected as (i) they can be objectively measured/captured (Elmagrhi & Ntim, 2022); and (ii) have been examined by prior studies, albeit within different research contexts (Adams & Ferreira, 2009; Elmagrhi & Ntim, 2022). Hence, our study is unique because no study has examined Chair-CEO age diversity, Chair-CEO generational age gap diversity and Chair-CEO gender diversity variables on CEO Pay and TER. The study also offers new insight on the crucial role of the combined effect of Chair-CEO diversity index (CCDI) on CEO Pay and TER. The CCDI refers to a firm with both Chair-CEO generational age gap diversity and Chair-CEO gender diversity. The CCDI therefore captures the combined effect of Chair-CEO diversity (more diverse Chair-CEO combination). Crucially, the findings of our study reveal that gender-diverse board on the basis of Chair-CEO gender diversity may be one possible way of limiting excessive CEO and executive remuneration packages in UK listed firms.

Second, we contribute to the scarce literature on the impact of Chair-CEO diversity on FP. Prior research exploring board diversity's impact on firm performance restrict their scope to either executive team characteristics or diversity among all the board members (Gyapong et al., 2016; Sarhan et al., 2019; Vafaei, Ahmed, & Mather, 2015), but essentially overlooked the relationship between non-executive directors (the Chair) and executive directors (the CEO), two important roles that are mutually expected to oversee the performance of firms (Chow, 2023). The focus on diversity between the co-leaders of the firm is crucial in terms of enhancing our understanding of the cognitive conflicts and social ties between them, which can impact on the effectiveness of the board and FP. Our study offers a first attempt to highlight the importance of various forms of Chair-CEO diversity attributes (age, generational age gap; and gender) in improving firm performance. Our study provides new insights that show that the combined effect of Chair-CEO diversity as measured by age, generational age gap; and gender (CCDI) appears to have a beneficial impact on the performance of the firms.

Third, we offer new insights regarding how firms may promote cognitive conflicts between the Chair and the CEO (Adu, Flynn, & Grey, 2022a; Zhou et al., 2019) and suggest that such cognitive conflicts will help increase the monitoring role of the board (Adu, Flynn, & Grey, 2022a) and mitigate the negative effect of groupthink. These findings corroborate and emphasis the impact of board diversity (Adu, Flynn, & Grey, 2022a; Zhou et al., 2019; Zhu et al., 2022) on board decision-making. Fourth, extending the work of Sarhan et al. (2019) on the ER-FP nexus, we assess the impact of both CEO Pay and TER on FP. The findings show that increased levels of CEO Pay, and TER are associated with higher FP.

Fifth, and more importantly, this paper enriches the emerging research on Chair-CEO diversity by investigating, for the first time, the moderating impact of Chair-CEO diversity attributes on the CEO Pay-FP and TER-FP relationships. Despite the increasing calls for board diversity research (Ahmed et al., 2021; Bugeja et al., 2016; Sarhan et al., 2019), the moderating effect of Chair-CEO diversity attributes on the relationship between ER and FP has received limited attention. Our findings reveal that Chair-CEO diversity attributes including age and gender have a significant influence on the association between ER and FP. In particular, the findings of this study demonstrate that the combined Chair-CEO diversity index (CCDI) has the greatest significant influence on the CEO Pay-FP and TER-FP relationships.

Finally, we explore whether the predicted relationships among Chair-CEO diversity, ER and FP differ in female as Chair (FCHAIR) and female as CEO (FCEO) samples. Our findings reveal that FCAHIR leads to more observable reductions in ER and an increase in FP. The results also show that the positive moderating impact of Chair-CEO diversity on ER-FP nexus is greater in the FCHAIR sample.

The remainder of the paper is structured as follows. Section 2 focuses on reviewing the existing literature on the effect of board diversity on both executive remuneration and firm performance. Next, we develop hypotheses based on upper echelons, homophily and resource dependence theories. In Section 3, our data and methodology is presented, and the results of the study are presented in Section 4. In Section 5, we provide tests for robustness. Finally, Section 6 provides conclusions with recommendations and a discussion of the potential for future research.

2. Literature review and hypothesis development

2.1. Social connections, demographic similarities and corporate outcomes

In the CG literature, a board is considered as independent when the members have no formal economic relationships with one another (Zhou et al., 2019). However, this traditional definition of board independence may not capture the probable impact of board social independence, the degree to which board members share informal social links with one another which can affect corporate outcomes (Goergen et al., 2015; Hwang & Kim, 2009; Zhou et al., 2019). It has been argued that board members' informal social connections are detrimental because they are not in the shareholders' best interests (Fracassi & Tate, 2012). For instance, these social connections can make the board less capable of monitoring corporate outcome (Zhou et al., 2019). To illustrate, similarity in board social connection can foster mutual concessions and compromises among the board members. In this context, board social similarity can encourage a "give and take" pay arrangements between the non-executive and executive directors, thereby leading to excessive ER packages.

Management theory of upper echelons and sociological theory of homophily are closely related to the development of social ties among board members (Zhou et al., 2019). First, according to an upper echelon's theoretical perspective, directors' demographics significantly affect how they perceive various management circumstances and how they make decisions (Hambrick & Mason, 1984). This perspective maintains that corporate executives draw upon their own cognitions, perceptions, values, experiences and evaluations to make decisions, solve problems, and implement strategies (Hambrick, 2007; Hambrick, Finkelstein, & Mooney, 2005). These can result in variance in FP due to differences in the individuals managing the firms (Allison et al., 2023). Hence, demographic attributes can potentially affect group thinking and decision-making processes (Zhou et al., 2019). For instance, demographic attributes may negatively affect the cohesiveness of a group

(Katz, 1982; Lott & Lott, 1961; O'Reilly, Caldwell, & Barnett, 1989) and the communication between group members (Smith et al., 1994; Wagner et al., 1984). Increased conflict within the group may result from issues with information flow and group cohesion, with detrimental effect on group decision-making process (Eisenhardt & Schoonhoven, 1990; Wagner et al., 1984).

Second, the theory of homophily (i.e., an affinity for similar others), predicts that an increased number of interactions can theoretically create a lot of personal and social ties among members in a group who share similar demographic attributes (Dumas, Phillips, & Rothbard, 2013; Marsden, 1987; McPherson et al., 2001). The reasoning behind this idea is that people seek to pick and interact with individuals who share similar traits with themselves (Byrne, 1971). For instance, people tend to interact with individuals with similar demographic traits (Zhu et al., 2021). One striking point, confirmed with solid empirical research, is the regularity 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. Similarity encourages connection (Lazarsfeld & Merton, 1954) on a variety of dimensions including race, age, gender, socioeconomic status, education, friends, spouses, coworkers, colleagues, and other professional associates (Kossinets & Watts, 2009).

In support of the above argument, Pfeffer (1983) conducted a study on the relationship between the dimensions of management control and demographic characteristics. The author observes that socialization 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. Such increased informal control can ensure the use of familiar vocabulary which can provide the ground for co-operation or mutual understanding. Thus, 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).

By contrast, impersonal and bureaucratic controls will be observed when there is demographic diversity among team members (Zhou et al., 2019). According to some academics, heterogeneous teams typically perform worse in a stable business environment since they require formal contacts (Murray, 1989). However, heterogeneous teams are desirable in an unstable business environment as it can facilitate adaptation (Murray, 1989). Supporters of this view emphasize that social ties between board members and the CEO can weaken the effectiveness of the boards' monitoring role (Fracassi & Tate, 2012; Lee et al., 2014; Murray, 1989). In particular, Fracassi and Tate (2012) find that the existence of social ties between board members and CEO weakens the intensity of the monitoring role of the board. The authors find that in such firms, CEOs engage in more value-destroying acquisitions (Fracassi & Tate, 2012) and internal agency conflicts intensifies (Lee et al., 2014).

In this study, we maintain that the strength of the social ties between the Chair and the CEO is determined by the differences (age and gender) between the two. Subsequently, it is expected that Chair-CEO age diversity, Chair-CEO generational age gap diversity, and Chair-CEO gender diversity can weaken the propensity to build strong social ties (Fracassi & Tate, 2012; Goergen et al., 2015; Zhou et al., 2019). This will lead to increase in cognitive conflicts and thereby enhancing the monitoring intensity of the board with valuable impact on corporate decisions including ER and FP.

2.2. The association between Chair-CEO diversity and executive remuneration

Age is a key demographic because it impacts board member's attitude and processing of information (Serfling, 2014; Yim, 2013). Chair-CEO age similarity can be a key signal of strong social ties between the Chair and the CEO. As discussed in Section 2.1, age similarity can have a detrimental effect on the effectiveness of boards' monitoring role, due to stronger social ties, and cognitive conflict is less likely between the Chair and the CEO (Zhou et al., 2019). The similarity between the Chair and CEO makes communication between the two more likely to result in affirmative feedback, lessens disagreements and reduces the level of board oversight (Lee et al., 2014). For instance, Wagner et al. (1984) observe that directors of a comparable age are likely to share experiences, and are thus likely to hold similar beliefs, opinions and attitudes. Chair-CEO age similarity can have key implications on pay incentives because the Chair is the board's head and is a key figures in determining ER packages (Zhu et al., 2021). From this perspective, Chair-CEO age similarity can have detrimental effect due to CEOs determining their own remunerations (reduced the level of board oversight) which would be expected to result in higher remuneration.

On the flip side, age dissimilarity is an important indicator of executives' heterogeneity and cognitive conflict (Zhu et al., 2022). A larger Chair-CEO age diversity, resulting in greater cognitive conflicts, can strengthen the board's monitoring capacity (Adams & Ferreira, 2007; Goergen et al., 2015; Zhou et al., 2019). The Chair and CEO will have different attitudes, behaviours, and ways of thinking due to their age dissimilarity (Zhu et al., 2021). In addition, the cognitive conflict between the Chair and CEO is exacerbated by their cognitive independence resulting from age dissimilarity (Zhu et al., 2021). We contend that difference in age between the Chair and the CEO will increase cognitive conflicts leading to better monitoring and proper alignment of ER with broader shareholder value. In particular, cognitive conflicts caused by Chair-CEO age diversity can potentially increase the intensity of board monitoring and thereby enhance constraints over the CEO power to motivate higher remuneration (Zhu et al., 2021). In particular, Chair-CEO age diversity can prevent CEOs from exercising power to excessively increase their pay. Hence, Chair-CEO age diversity can enable the Chair to link CEO Pay to the performance of the firm (CEO Pay-FP nexus) by restraining the power of the CEOs (Zhu et al., 2021). This implies that substantial age difference leads to cognitive differences between the Chair and the CEO, resulting in more intensive monitoring in the form of deeper scrutiny and critical judgment of the board's decisions and proposed actions in key areas such as ER (Adu, Flynn, & Grey, 2022c; Goergen et al., 2015; Zhu et al., 2021). In support, other scholars echo that Chair-CEO age diversity can attenuate the tendency for corporate executives to engage in excessive risk-taking (e.g., Zhou et al., 2019) with beneficial implication on ER.

Additionally, we are interested in gender difference between the Chair and CEO. Drawing from the economics and sociology literatures, we propose that gender dissimilarity between the Chair and CEO can reduce ER. This is based on the suggestion that when the Chair and the CEO are from the same gender, the likelihood of cognitive conflict between them is reduced (Fracassi & Tate, 2012; Goergen et al., 2015; Zhou et al., 2019). This leads to informal ties between the Chair and the CEO. Mutual gender alignment offers a platform for homophily (i.e., an affinity for similar others), opening the gateway to interactions and the development of 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 (Marsden, 1987; McPherson et al., 2001). The increase in the informal contacts and social connections, when the Chair and the CEO are the same gender, can potentially weaken the intensity of the board's monitoring role (Fracassi & Tate, 2012; Murray, 1989; Zhou et al., 2019). In this case, similarity among the Chair and the CEO means the Chair might be pre-disposed to be more generous to the CEO, which can lead to an increase in CEO Pay.

By contrast, "contact between similar people occurs at a higher rate than among dissimilar people" (McPherson et al., 2001 p. 416). This suggests that when the Chair and the CEO are different genders, the tendency for informal contacts and social connection decreases. It is expected that Chair-CEO gender dissimilarity, leading to cognitive

conflicts, will strengthen the board's monitoring role (Goergen et al., 2015; Zhou et al., 2019). We maintain that Chair-CEO gender diversity will increase cognitive conflicts resulting in better monitoring and proper alignment of ER with shareholder interests. For instance, prior studies stress that interpersonal conflict becomes more prominent when there is a gender difference between the Chair and the CEO (Adu, Flynn, & Grey, 2022c).

Furthermore, the resource dependence theory encourages boards to value the different knowledge, experience, and principles that each member brings to the board (Post & Byron, 2015). In this case, firms whose Chair and CEO come from diverse demographic backgrounds, will have experiences and skills needed to improve the effectiveness of the oversight role of the board, especially regarding ER packages (Adu, 2023a). Because female directors including Chair and CEOs tend to engage in superior monitoring (Adu, Flynn, & Grey, 2022a; Elmagrhi, Ntim, Elamer, & Zhang, 2019), we argue that Chair-CEO diversity on the basis of gender can bring differing critical perspectives to board decisions, which can limit excessive ER packages. In particular, Post and Byron (2015) maintain that female board representation is positively related to two primary responsibilities of boards: enhanced monitoring and strategy involvement. Thus, based on the arguments above, the first hypothesis is as follows:

Hypothesis 1. *There is a negative association between Chair-CEO diversity attributes and executive remuneration (ER).*

2.3. The association between Chair-CEO diversity and firm performance

As discussed in Section 2.1, theoretically, an increase in the cognitive conflicts resulting from Chair-CEO diversity can be beneficial in terms of improving the boards' monitoring role, and beneficially impact FP. Zhu et al. (2022) maintain that greater Chair-CEO age dissimilarity results in more board monitoring and higher firm value. In support, Goergen et al. (2015) argue that a larger Chair-CEO age diversity precipitates cognitive conflict between them, which in turn leads to increased monitoring role of the board and higher firm value. In this regard, Chair-CEO age diversity may have beneficial effect on FP due to the cognitive conflicts originating from differences in experiences, attitudes, beliefs, skills and values between them (Goergen et al., 2015) which can lead to more critical assessment to determine the appropriateness of projects and strategies proposed by the CEO (Chow, 2023).

This theoretical viewpoint is also complemented by the resource dependence theory which postulates that board diversity improves firms' relationship with their broad stakeholders with beneficial effect on the value of the firm (Reguera-Alvarado et al., 2017; Sarhan et al., 2019) as well as increasing the legitimacy of the firm (Adu, 2022; Wang et al., 2014). Legitimacy refers to the extent to which different stakeholders regard the actions of a firm as useful, proper and desirable (Suchman, 1995). This legitimacy is related to obtaining stakeholders support and to access to critical resources (Adu, 2022; Mahadeo, Soobaroyen, & Hanuman, 2012). With strong legitimacy, firms secure better access to economic resources, attract and retain talented employees, improve relationships with stakeholders, and compete more effectively in the market (Orazalin, Ntim, & Malagila, 2023; Pfeffer & Salancik, 1978). In this regard, the resource dependence theoretical perspective stresses that demographic differences among directors including the Chair and CEOs professional skills and social networks will bring about greater synergies (Lee, Cho, Arthurs, et al., 2019). Examples of these vital resources include financial resources, physical assets and investment opportunities (Mahadeo et al., 2012; Orazalin et al., 2023). Gaining access to these resources will be associated with an increase in firm value (Adu, 2022). Firms seeking legitimacy may engage in substantive ('economically efficient') legitimisation strategies. Substantive strategies involve fundamental changes in a firm's goals, behaviours and practices to meet the expectations and needs of societal stakeholders (Haque & Ntim, 2020; Orazalin et al., 2023). In this case, firms seeking legitimacy may ensure that both executive and non-executive board members are appointed from diverse backgrounds, as a means of influencing the flow of vital resources such as capital, contracts and human capital to the firms which may lead to improved FP and firm value (Adu, 2023b). In support, others maintain that firms may gain social legitimacy by voluntarily adopting and/or complying with recognized institutional standards, rules and norms (Scott, 2001). In addition, complying with the board diversity guidelines issued by the UK government and regulators may not only improve legitimacy by enhancing the firms' image but also promote economic efficiency through having access to key resources. Based on the resource dependence theoretical perspective, firms with Chairs and CEOs from diverse demographic backgrounds will have access to experiences and skills needed to improve both the oversight effectiveness of boards and FP. In particular, Chair-CEO diversity on the basis of gender can bring differing perspectives to board decisions which can enhance FP.

Despite these arguments, we know relatively little concerning how Chair-CEO diversity may impact FP, as empirical evidence on the association between Chair-CEO diversity and FP remains scarce. In a related study, Goergen et al. (2015) explain that a positive association between Chair-CEO age dissimilarity and monitoring intensity is expected to increase firm value. The authors find a significantly positive effect of Chair-CEO age dissimilarity on firm value. In addition, Lee et al. (2014), Fracassi and Tate (2012) and, Hwang and Kim (2009) provide evidence that social ties between the CEO and the other directors lessen firm value as they weaken the intensity of monitoring by the board in the US. Nguyen (2012) detects similar results for large firms in France. Consequently, we seek to contribute to extant literature by examining the impact of Chair-CEO diversity attributes (age, gender and combined diversity index) on FP. Based on theoretical predictions and prior studies that document a positive association between board diversity and FP (Gyapong et al., 2016; Sarhan et al., 2019; Vafaei et al., 2015), we expect Chair-CEO diversity to have a positive impact on FP. Hence, as depicted in Fig. 1, our second hypothesis (H2) is stated as follows:

Hypothesis 2. *There is a positive association between Chair-CEO diversity attributes and firm performance (FP).*

2.4. The relationship between executive remuneration and firm performance

It has been suggested that linking ER to FP can mitigate agency problems by aligning manager incentives with those of owners (Jensen & Meckling, 1976). For instance, to resolve these agency problems, many scholars maintain that attractive ER may be an effective

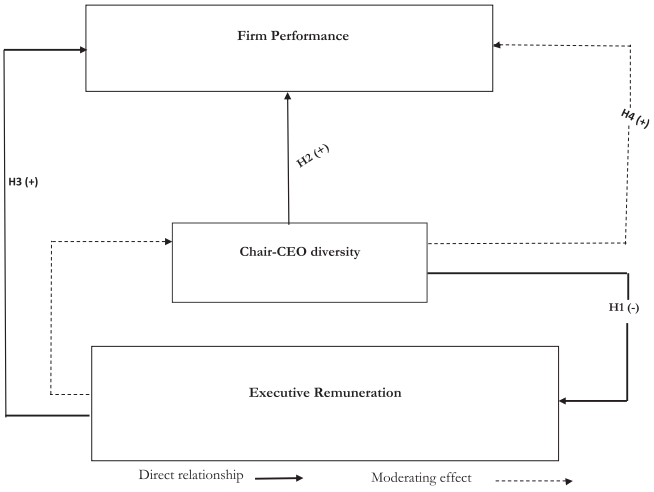

Fig. 1. Conceptual framework of hypothesis development for executive remuneration-for-firm performance nexus.

governance mechanism that would be able to align corporate executives' interest with those of the shareholders and also improve the executive's involvement in achieving the shareholders' objectives (Zoghlami, 2021). In this case, ER can be considered as an important internal governance mechanism that can resolve conflicts between corporate executives and the shareholders (Adu, Flynn, & Grey, 2022c; Bebchuk & Fried, 2003). Highly effective CEOs will be paid more according to the ER-FP relationship, which is consistent with the efficient contracting theory (Rashid, 2013).

Synthesis of literature also reveals that prior studies have examined the economic relationship between ER and FP. The findings of the first stand of literature shows that ER has positive impact on FP (e.g., Adu, 2022; Adu, Al-Najjar, & Sitthipongpanich, 2022; Hall & Liebman, 1998; Hallock, 1998; Jensen & Murphy, 1990; Sarhan et al., 2019). For example, Rashid (2013) finds a positive relationship between ER and FP. Further, Unite, Sullivan, Brookman, Majadillas, and Taningco (2008) detect a positive relation between ER and FP. The empirical findings by Sarhan et al. (2019) and Adu, Al-Najjar, and Sitthipongpanich (2022) also show that ER is positively associated with FP. In a closely related study, Zoghlami (2021) observe that an increase in CEO Pay is associated with improved FP.

Another strand of literature also reports that ER has no effect on FP (Duffhues & Kabir, 2008; Fernandes, 2008; Ozkan, 2011; Tosi, Misangyi, Fanelli, & Waldman, 2004; Tosi, Werner, Katz, & Gomez-Mejia, 2000). The authors explain that the positive impact of incentive on ER appears to be offset by the increase of salary charges harming the overall FP, hence the insignificant relationship. Finally, some studies also document a negative relationship between ER and FP (e.g., Basu, Hwang, Mitsudome, & Weintrop, 2007; Ejaz, Razali, & Muhammad, 2019). For instance, Ejaz et al. (2019) examine the impact of CEO Pay on FP. The authors find a negative relationship between CEO Pay and FP. Based on the empirical evidence, as well as the discussion above, we develop the following hypothesis:

Hypothesis 3. *There is a positive association between executive remuneration (ER) and firm performance (FP).*

2.5. The moderating effect of Chair-CEO diversity on the pay-performance nexus

Prior research largely examines the direct relationship between ER and FP, and reports mixed results (e.g., Focke, Maug, & Niessen-Ruenzi, 2017; McGuire, Dow, & Argheyd, 2003). One main limitation of these prior studies is that they do not consider the moderating effect of non-executive and executive attributes on this relationship. It has been suggested that CG mechanisms (as monitoring roles) and executive remuneration contracts (for alignment of interests) can be employed by firms to reduce the consequences of agency conflicts (Sarhan et al., 2019). Meanwhile, (Zhu et al., 2022) maintain that Chair-CEO diversity results in intensified monitoring and higher firm value. This suggests that Chair-CEO diversity can play a vital role in aligning the interest of shareholders with executives. Arguably, cognitive conflicts resulting from Chair-CEO diversity can ensure that ER schemes are linked to the performance of executives. In support, Zhu et al. (2021) argue that cognitive conflicts caused by Chair-CEO dissimilarity can help in increasing the intensity of the board's monitoring role and limiting the CEOs and corporate executives' power in setting their own pay. More importantly, Chair-CEO diversity promotes accountability by creating a business environment that allows the Chair to reduce non-performance related income by restraining the CEO's power (Adu, Flynn, & Grey, 2022a; Zhu et al., 2021), thereby reducing the tendency for executives to be generously rewarded for weaker performance. In this case, Chair-CEO diversity can reduce information asymmetry and agency costs (Zhu et al., 2021), and with a beneficial effect on the ER-FP nexus. According to the benefit aspect of legitimacy, complying with the board diversity (including Chair-CEO diversity) and ER package guidelines issued by the UK government and regulators may not only improve firm legitimacy by enhancing the corporate image of the firm but also promote economic efficiency through having better access to key resources (resource dependence theory).

Other scholars suggest that the proper alignment of ER through effective monitoring (induced by cognitive conflicts) can also motivate executives to limit excessive risk-taking which in turn increases FP (Mehran, 1995). Thus, the ER-FP nexus can be strengthened by enhanced monitoring associated with ER design, that aligns shareholder and managerial interests, leading to operational efficiency and improved FP (Jensen & Murphy, 1990).

There is a lacuna of empirical studies investigating the moderating influence Chair-CEO diversity attributes and to address this, our study attempts to make original contributions in this area of research. With respect to executive gender, the findings of prior studies (Adams & Ferreira, 2009; Elmagrhi & Ntim, 2022) suggest that gender diversity may enhance boardroom efficiency by increasing managerial monitoring, which can enhance the ER-FP nexus. Following from the above discussion, which clearly indicates the importance of Chair-CEO diversity in enhancing the boards' monitoring and supervision, and aligning ER with FP, we would expect Chair-CEO diversity to have positive moderating effect on the ER-FP nexus. Thus, and given that Chair-CEO diversity attributes are expected to moderate the link between pay and performance, our final hypothesis to be tested is:

Hypothesis 4. *Chair-CEO diversity attributes significantly moderate the link between executive remuneration (ER) and firm performance (FP).*

Fig. 1 presents the conceptual framework, outlining the predicted relationships among Chair-CEO diversity, ER, and FP. It shows the direct effects of Chair-CEO diversity and ER on FP, the direct effect of ER on FP, and the moderating effects of Chair-CEO diversity attributes on these relationships.

3. Data and methodology

3.1. Sample

The initial sample is based on 3144 firm-year observations from 262 non-financial listed firms from the UK FTSE 350 index over a 12 year period (2009–2020). The FTSE 350 was selected because of its broad-spectrum, encompassing a wide collection of industries and contains large firms that might set the pace for Chair-CEO diversity and ER schemes (Adu, Flynn, & Grey, 2023). We collected the ER data including CEO Pay from BoardEx. The Chair-CEO diversity data were manually gathered from the annual reports of the firms along with the data on CG. The financial data including FP data was sourced from the EIKON database.

We removed 699 observations based on missing firm-level ER data in the BoardEx database and Chair-CEO diversity information in the annual reports. Our final sample is based on an unbalanced panel dataset of 2445 firm-year observations.

3.2. Dependent variables

Table 1 summarises all the variables, which we employ in examining our hypotheses.

The study employs firm performance (FP), CEO Pay and executive remuneration (ER) including CEO Pay as dependent variables. Firm performance is measured using return on assets (ROA) and Tobin's Q as accounting- and market-based firm performance measures, respectively. ROA measures accounting return/short-term firm performance, whilst Tobin's Q is considered a market performance/long-term firm performance (Gyapong et al., 2016; Sarhan et al., 2019).

CEO Pay is measured using the natural log of total fixed and variable compensation paid to the CEO (in Great Britain Pounds) as reported by the firm. Total executive remuneration (TER) is measured using the

Table 1
Variable definitions.

Variable	Abbreviation	Description	Source
Firm performance	FP		
Return on assets	ROA	Percentage of operating profit to total assets.	EIKON database
Market-to-book ratio	Tobin's Q	Market value of common shares outstanding plus market value of preferred shares outstanding plus book value of debt divided by book value of assets.	EIKON database
Executive remuneration	ER		
CEO Pay	CEO Pay	The natural log of total fixed and variable compensation paid to the CEO (in Great Britain Pounds) as reported by the firm. The fixed component consists of a base salary and other in-kind benefits, such as accommodation, health and transportation. The variable component consists of bonuses and other long-term incentive plans, such as equity ownership and long-term share options.	BoardEX
Total executive remuneration	TER	The natural log of total fixed and variable compensation paid to all corporate executives including the CEO (in Great Britain Pounds) as reported by the firm. The fixed component consists of a base salary and other benefits-in-kind, such as accommodation, health and transportation. The variable component consists of bonuses and other long-term incentive plans, such as equity ownership and long-term share options.	BoardEX
Measures of Chair-CEO dissimilarity			
Chair-CEO diversity index	CCDI	Chair-CEO diversity index, as measured by gender and age gap. Where 1 = gender difference, 0 no gender difference and 1 = 20 year age gap, and 0 otherwise). The scores are then summed to show the combined effect of Chair-CEO diversity with 2 indicating most diverse Chair-CEO firm, and 0 least diverse firm.	Annual report
Chair-CEO age difference	CCAD	The chair's age minus the CEO's age.	Annual report
Chair-CEO age gender difference	CCGD	Equals to 1 if the chair and the CEO have different gender, and 0 otherwise.	Annual report
Chair-CEO age gap 20	CCGP	Equals to 1 if the absolute chair-CEO age difference is at least 20 years, and 0 otherwise.	Annual report
Board gender diversity	BGD	The total number of females on the board of directors/size of the board.	Annual report
Corporate governance variables			
Board size	BSIZE	The natural log of the number of board members.	Annual report
Board independence	INDEP	Board independence is the percentage of independent directors.	Annual report
Number of board meetings	NBMs	Natural logarithm of the number of board meetings each year.	Annual report
Firm-specific control variables			
Firm size	FSIZE	The natural log of total assets of a firm.	EIKON database
Leverage	LEV	The ratio of total debt to total assets.	EIKON database
Age of the firm	AGE	The natural log of the age of the firm since inception.	EIKON database
Capitalization	CAP	Equity capital divided by total assets.	EIKON database
Audit firm size	BIG4	1 if a firm is audited by the big four audit firm (PricewaterCoopers, Deloitte, Ernest & Young and KPMG), and 0 otherwise.	Annual report
Research & development	Research and development	Natural logarithm of research and development cost of a firm scaled by total assets Year, 2009–2020	EIKON database

natural log of total fixed and variable compensation paid to all corporate executives including the CEO (in Great Britain Pounds) as reported by the firm. The fixed component consists of a base salary and other benefits-in-kind, such as accommodation, health and transportation. The variable component consists of bonuses and other long-term incentive plans, such as equity ownership and long-term share options.

3.3. Independent variables

Following Adu, Flynn, and Grey (2022a) and Zhou et al. (2019), we use four variables to measure Chair-CEO diversity. The Chair-CEO age diversity (CCAD) equals to the Chair's age minus the CEO's age. The difference can be positive or negative signifying that cognitive conflict between the two may arise in either case. Zhou et al. (2019) posit that cognitive conflict between the Chair and the CEO is likely to be greatest when there is a generational age difference. A generation gap refers to the chasm that separates the thoughts expressed by members of two different generations (Zhu et al., 2021). In this regards, a generation gap can be used to depict the differences in actions, hobbies, communication ways, beliefs and professional attitudes exhibited by members of younger generations compare with the older generations (Adu, 2023b; Adu, Flynn, & Grey, 2022c; Zhu et al., 2021). Based on sociological research norms, only age differences of 20 years or more are labelled a generational gap (Zhu et al., 2021). For instance, Strauss and Howe (1997) refer to a generational gap as an age difference of at least twenty years. A synthesis of the literature reveals that, prior studies apply 20 years as generational age gap (e.g., Adu, Flynn, & Grey, 2022c; Strauss & Howe, 1997; Zhou et al., 2019). Admittedly, some studies capture a generational age gap based on a differential of 10 years or less due to data limitations (Zhu et al., 2021). In particular, Zhu et al. (2021) demonstrate that there are few listed firms in China with an age differential between the Chair and the CEO of 20 years or more. The authors stress that in state-holding firms, such a large age difference does not exist due to the limitations of employment period and promotion. Accordingly, we follow a well-established prior literature and capture a generational gap as an age difference of at least twenty years (Adu, Flynn, & Grey, 2022c; Strauss & Howe, 1997; Zhou et al., 2019). Following Zhou et al. (2019) and, Strauss and Howe (1997), and to describe the Chair-CEO generational gap of 20 years (CCGP), this study defines the Chair and CEO generation gap as 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 include other key variables that capture Chair-CEO diversity. To capture for gender diversity, 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 (CCGD). Additionally, we apply Chair-CEO diversity index (CCDI). The CCDI refers to a firm with both Chair-CEO generational age gap diversity and Chair-CEO gender diversity. The latter variable captures the combined effect of Chair-CEO diversity.

We use variables that are common in the CG literature to measure board and firm specific characteristics. Following well-established literature (e.g., Allison et al., 2023; Pham & Lo, 2023; Haque & Ntim, 2020; Grey, Flynn, & Donnelly, 2020; Grey, Stathopoulos, & Walker, 2013), we include board size (BSIZE), board independence (INDEP), firm size (FSIZE), number of board meetings (NBMs), audit firm size (BIG4), age of the firm (AGE), leverage (LEV), capitalization (CAP) and, research and development (R&D) as control variables explained in Table 1, in order to limit possible omitted variables bias.

3.4. Empirical models

The association among Chair-CEO diversity, ER and FP is jointly and dynamically determined (Guest, 2009). Hence, several endogenous problems could arise due to possible omitted variables that can simultaneously affect Chair-CEO diversity, ER and FP (Adams & Ferreira, 2009; Sarhan et al., 2019). Additionally, endogenous problems may arise from firm specific characteristics including managerial skills, challenges, opportunities and leverage, which change overtime (Adams & Ferreira, 2009; Guest, 2009; Sarhan et al., 2019). Hence, and given the panel nature of the data and following well-established literature (e.g., Adams & Ferreira, 2009; Gyapong et al., 2016; Raharjo, Hakim, Manurung, & Maulana, 2014; Sarhan et al., 2019; Zhu et al., 2021), we estimate a firm fixed-effects regression model in order to account for potentially omitted variables and unobserved firm-specific heterogeneities. The Hausman-test is employed to determine which model, the fixed effects model or with the random effects model, best explains our data (Raharjo et al., 2014). The Hausman test result suggests that a fixed-effects model is appropriate for our unbalanced panel dataset. Precisely, we follow Zhu et al. (2021) and report robust t-statistics that are based on standard errors clustered by industry and year. The firm fixed-effects regression model employed is specified as follows:

$$\begin{aligned} ER_{it} =& \alpha_0 + \beta_1 \text{Chair} - \text{CEO diversity}_{it} + \beta_2 \text{Board characteristics}_{it} \\ &+ \beta_3 \text{Firm characteristics}_{it} + \beta_4 \text{Year}_{it} + \beta_5 \text{Industry}_{it} + \delta_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

Where:

ER is the executive remuneration measures depending on the specification, either CEO Pay or TER. Similarly, Chair-CEO age diversity denotes Chair-CEO diversity measures, depending on the specification, either Chair-CEO age difference (CCAD), Chair-CEO age gap 20 (CCGP), Chair-CEO gender difference (CCGD) and Chair-CEO diversity index (CCDI); and the fixed-effects of a vector of the mean differences of all time-variant variables.

The second fixed-effects model investigates the effect of Chair-CEO diversity on the firm performance together with the firm-specific controls and the dummy variables. The second investigation is estimated as below:

$$\begin{aligned} FP_{it} =& \alpha_0 + \beta_1 \text{Chair} - \text{CEO diversity}_{it} + \beta_2 \text{Board characteristics}_{it} \\ &+ \beta_3 \text{Firm characteristics}_{it} + \beta_4 \text{Year}_{it} + \beta_5 \text{Industry}_{it} + \delta_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

Where:

Chair-CEO diversity refers to the four Chair-CEO diversity measures as specified in Eq. (1). FP refers to the firm performance measures which is either ROA or Tobin's Q depending on the specification. All other variables remain the same as specified in Eq. (1).

Finally, to examine the moderating impact of various Chair-CEO diversity variables on the relationship between ER and FP, we modify Sarhan et al. (2019) model by including a moderation variable (Chair-CEO diversity * ER). The fixed-effects regression model is stated as follows:

$$\begin{aligned} FP_{it} =& \alpha_0 + \beta_1 Chair - CEO\ diversity_{it} + \beta_2 Chair - CEO\ diversity_{it} * \beta_3 ER_{it} \\ &+ \beta_4 ER_{it} + \beta_5 Board\ characteristics_{it} + \beta_6 Firm\ characteristics_{it} \\ &+ \beta_7 Year_{it} + \beta_8 Industry_{it} + \delta_{it} + \varepsilon_{it} \end{aligned}$$

Where:

Chair-CEO diversity*ER refers to an interaction variable between Chair-CEO diversity and ER. We included four interaction variables between the Chair-CEO diversity variables (CCAD, CCGP, CCGD, and CCDI) and ER (CEO Pay and TER). We predict that the moderation variables Chair-CEO diversity*ER will enhance the ER-FP nexus by improving boardroom efficiency through increased managerial monitoring. FP refers to the firm performance measures which is either ROA or Tobin's Q depending on the specification. All other variables remain the same as specified in Eq. (1).

3.5. Descriptive statistics

Table 2 displays the summary statistics of the variables included in the analysis. The results in Panel A which presents the FP variables the reveal that the FP as measured by ROA spans from −7.82 to 3.43, with a mean figure of 0.06, whereas Tobin's Q has a mean of 1.26, values range from −0.08 to 9.27. Panel B provides the summary statistics for the ER measures. It shows that CEO Pay has an average figure of 6.98, with a standard deviation (SD) of 2.45, whilst TER has an average of 9.97 and a SD of 3.12. These findings are consistent with the evidence of prior studies (Elmagrhi et al., 2020; Sarhan et al., 2019).

Panel C presents the descriptive statistics for the various Chair-CEO diversity variables. The average of Chair-CEO diversity index (CCDI) is 0.97 with a minimum of 0.00 and a maximum of 2.00. The mean age difference between the Chair and the CEO (CCAD) is 5.93 years. We observe at least 20 years of age difference (CCGP) between the Chair and CEO is 15% of all firms in the data. We find that there is a gender dissimilarity between the Chair and the CEO (CCGP) for 5% of all observations. Mean board size is 10, which is similar to the evidence of Haque and Ntim (2018). Independent directors, on average, represent 69% of the board.

Table 2
Sample description for 2445 firm-year observations.

Variable	Mean	Std. Dev.	Min	Max
Panel A: Firm performance				
ROA	0.06	0.30	−7.82	3.43
Tobin's Q	1.26	3.05	−0.08	9.27
Panel B: Executive remuneration				
CEO Pay (In)	6.98	2.45	0.00	12.98
TER (In)	9.97	3.12	0.00	15.32
Panel C: Chair-CEO diversity				
CCDI	0.97	0.14	0.00	2.00
CCAD	5.93	0.18	−11.00	34.00
CCGP	0.15	0.35	0.00	1.00
CCGD	0.05	0.20	0.00	1.00
BGD	21.04	10.98	0.00	69.65
Panel E: Control variables				
BSIZE	9.80	2.72	4.00	24.00
INDEP(%)	68.88	10.00	20.00	90.00
NBMs	7.60	2.97	0.00	24.00
BIG4	0.98	0.12	0.00	1.00
AGE (years)	35.36	0.65	12.00	138
FSIZE (In)	21.20	5.25	0.00	29.58
LEV	0.24	0.28	0.00	3.69
CAP	0.45	0.33	2.51	2.37
R&D	0.04	0.03	0.01	0.08

Note: Please see Table 1 for variable definitions.

Table 3
Correlation matrix.

Variable	ROA	TOBINQ	CEO PAY	TER	CCDI	CCAD	CCGP	CCGD	BSIZE	INDEP	NBMs	BIG4	AGE	FSIZE	LEV	CAP	R&D
ROA	1																
TOBINQ	0.10	1															
CEO PAY	0.53**	0.04***	1														
TER	0.37*	0.31**	0.37*	1													
CCDI	0.10***	0.01**	−0.02*	−0.04**	1												
CCAD	0.03***	0.02*	−0.11*	−0.09	0.02	1											
CCGP	0.01**	0.01***	−0.01**	−0.01**	0.08	0.01*	1										
CCGD	0.15***	0.01**	−0.05*	−0.04**	0.08	0.05*	0.03	1									
BSIZE	0.08**	0.09*	0.20**	0.21*	−0.01	0.01*	0.25*	0.19*	1								
INDEP	−0.08*	−0.18	0.07*	0.14**	0.01	0.04	−0.10*	0.22	0.08*	1							
NBMs	0.04	0.09	−0.06*	0.08	0.02	−0.01	0.11	0.03	−0.12*	0.05	1						
BIG4	−0.03	−0.31	0.02	0.40	−0.01*	0.11	0.06	0.05	0.01	0.03	0.04*	1					
AGE	0.06***	0.05***	0.10**	0.02**	−0.09	0.08*	0.08*	0.08**	0.06*	0.02	0.09	0.09*	1				
FSIZE	0.07***	0.09***	0.26**	0.25***	−0.05*	−0.02	0.32	0.20	0.19*	0.28*	−0.07	0.08	0.40*	1			
LEV	−0.06**	−0.06**	0.05*	−0.02	−0.07	0.07*	0.07	0.03*	0.08*	−0.05	0.03*	0.02	0.05	0.04	1		
CAP	−0.26**	−0.04***	−0.15*	−0.16	−0.06	0.05*	−0.20*	−0.15*	−0.12	−0.19*	−0.20	−0.08	−0.23	−0.07	0.04	1	
R&D	−0.03**	−0.02**	−0.02**	0.05	0.01*	−0.14	0.08	0.03**	−0.11	0.05	0.07	0.03	−0.21	0.06*	0.08	−0.09	1

Notes: and ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Please see Table 1 for full variable definitions.

Table 3 presents the correlation between the dependent and independent variables. The correlation between the Chair-CEO diversity and ER variables are negative and significant, meaning that Chair-CEO diversity reduces ER, in line with our main hypothesis (H1). Additionally, the correlation between the Chair-CEO diversity variables and FP are positive and significant, implying that Chair-CEO diversity increases FP consistent with our hypothesis (H2). These initial finding prompts us to conduct additional analyses to unveil the association between Chair-CEO diversity and ER, and Chair-CEO diversity and FP. Noticeably, the correlation in any specification does not exceed 0.80, demonstrating that multicollinearity is not an issue in our sample (Benlemlih, Arif, & Nadeem, 2022; Liu et al., 2014).

4. Regressions results

4.1. *Results for Chair-CEO diversity, executive remuneration and firm performance*

The fixed-effects regression results of the effect of various Chair-CEO diversity measures on ER, are reported in Table 4. In all specifications, we include all control variables and year and year industry dummies.[1] First, we regress Chair-CEO age difference (CCAD) on CEO Pay, the results are presented in Column 1. We find a negative and insignificant relationship between the two, indicating that CCAD has negative but weak impact on CEO Pay. We replace CCAD with CCGP, the results are presented in Column (2). The coefficient on CCGP (−0.710) is negative and statistically significant at the 5% level, hence, H1 is empirically supported. The economic implication of this evidence is that a one standard deviation increase (decrease) in CCGP will be associated with about a 0.249 (0.710*0.35) decrease (increase) in CEO Pay. Next, as predicted by this study, the results in Column (3) of Table 4 show that CCGD is negatively related to CEO PAY (−0.607, $p < 0.001$), thus providing support to H1. Economically, the evidence implies that a one standard deviation increase (decrease) in the percentage of CCGD will be associated with about a 0.121 (0.607*0.20) increase (decrease) in CEO PAY. Moving on, the results in Column (4) of Table 4 demonstrate that CCDI exerts a negative impact on the CEO PAY (−0.624, $p < 0.001$), thus, H1 is empirically supported. The economic implication of this evidence is that a one standard deviation increase (decrease) in CCDI will be associated with about a 0.087 (0.624*0.14) decrease (increase) in the CEO PAY. We hypothesized that Chair-CEO age dissimilarity will lead to cognitive conflicts which will result in effective monitoring and reduction in CEO Pay. The findings in Table 4, Columns (1) to (4), are in line with our predictions. Thus, our first hypothesis is strongly supported, implying that Chair-CEO diversity reduces CEO Pay levels. By contrast, the results reaffirm our reasoning that similarity among directors means they are pre-disposed to be more generous to the group most like them, which can lead to an increase in CEO Pay.

Second, we also find consistent results when we replace CEO Pay with total executive remuneration (TER), which further strengthens our main results. Specifically, we regress the four Chair-CEO diversity variables (CCAD, CCGP, CCGD and CCDI) on TER and the results are reported in Columns (5)–(8) of Table 4. The study documents a negative and insignificant association between CCAD and TER in Column (5), indicating that CCAD has a negative but weak effect on TER, suggesting that H1 is rejected. Further, the findings in Column (6) of Table 5 point to the evidence that, CCGP is negatively associated with the TER (−0.296, $p < 0.05$), hence, H1 is empirically supported. Economically, the evidence is significant because it suggests that a one-standard deviation increase (decrease) in CCGP will be associated with about a 0.104 (0.296*0.35) increase (decrease) in the TER. The results in Column (7) of Table 5 also reveal that CCGD has negative impact on the TER (−0.498, $p < 0.05$), implying that H1 is empirically supported. The

[1] In all our estimation models, we include year and industry dummies.

Table 4
Fixed-effects regression results on the relationship among Chair-CEO diversity, executive remuneration and firm performance.

Dep. variable	CEO PAY	CEO PAY	CEO PAY	CEO PAY	TER	TER	TER	TER	ROA	ROA	ROA	ROA	TOBINQ	TOBINQ	TOBINQ	TOBINQ
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CCAD	−0.022				−0.001				0.051				0.003			
	(1.45)				(0.010)				(1.07)				(1.45)			
CCGP		−0.710**				−0.296**				0.046*				0.046*		
		(−2.56)				(−2.34)				(1.78)				(1.67)		
CCGD			−0.607***				−0.498**				1.668***				0.091**	
			(−3.88)				(−2.26)				(3.20)				(2.43)	
CCDI				−0.624***				−0.345**				4.029***				0.870**
				(−4.57)				(−2.10)				(3.74)				(2.53)
BSIZE	0.001**	0.007**	0.057	0.052**	0.288**	0.297**	0.259*	0.271*	0.139***	0.067***	0.697***	0.308***	0.030***	0.027***	0.093***	0.089***
	(1.97)	(2.52)	(1.48)	(2.05)	(2.44)	(2.32)	(1.68)	(1.73)	(4.32)	(3.35)	(2.68)	(3.56)	(3.97)	(3.14)	(3.08)	(4.74)
INDEP	−0.020***	−0.021***	−0.022***	−0.021***	−0.012**	−0.010**	−0.012**	−0.011**	−0.001	−0.009	−0.009	−0.015	−0.006	−0.006	−0.001	−0.002
	(−4.32)	(−5.68)	(−3.76)	(−2.94)	(−1.98)	(−2.06)	(−1.98)	(−2.33)	(−0.78)	(−0.54)	(−0.92)	(−0.17)	(−1.22)	(−0.57)	(−0.55)	(−0.36)
NBMs	0.001 (0.85)	0.007	0.004	0.005	0.234	0.265	0.236	0.236	0.202	0.172	0.182 (1.47)	0.171	0.233	0.234	0.022	0.021
		(0.69)	(0.81)	(0.77)	(0.65)	(0.84)	(0.93)	(0.76)	(1.32)	(1.11)		(1.59)	(0.92)	(0.67)	(1.30)	(0.54)
BIG4	−0.139	−0.196	−0.171	−0.178	−0.478	−0.492	−0.477	−0.485	−1.766	−1.023	−0.767	−0.956	−0.012	−0.070	−0.252	−0.255
	(−1.34)	(−1.53)	(−1.49)	(−1.35)	(−1.03)	(−1.20)	(−1.34)	(−1.50)	(−0.83)	(−0.55)	(−0.30)	(−1.27)	(−1.48)	(−0.90)	(−1.63)	(−1.37)
AGE	0.901**	0.892*	0.914**	0.908***	1.085**	1.074**	1.089**	1.085**	0.592***	0.616***	0.556***	0.631**	0.299**	0.300**	0.065***	0.064***
	(2.24)	(1.74)	(2.47)	(3.15)	(2.10)	(2.47)	(2.52)	(2.44)	(3.75)	(2.82)	(3.38)	(2.27)	(2.06)	(2.37)	(3.40)	(2.86)
FSIZE	0.026***	0.024***	0.024***	0.023***	0.041**	0.040***	0.040***	0.039**	0.069***	0.060***	0.098***	0.081***	0.033***	0.033**	0.016***	0.016***
	(4.38)	(3.57)	(6.83)	(2.96)	(2.28)	(5.54)	(3.46)	(2.33)	(3.67)	(3.05)	(4.11)	(2.57)	(3.17)	(2.51)	(4.08)	(3.34)
LEV	−1.136***	−0.023**	−1.076***	−1.065***	−0.359**	−0.344***	−0.333***	−0.335**	−2.963***	−2.940***	−3.804***	−3.498**	−1.512***	−1.508***	−0.932***	−0.930***
	(−3.70)	(−2.18)	(−4.23)	(−3.04)	(−2.17)	(−6.58)	(−4.86)	(−2.07)	(−4.22)	(−2.71)	(−3.90)	(−2.42)	(−3.54)	(−2.76)	(−4.73)	(−5.03)
CAP	−0.531	−0.066***	−0.054	−0.035	−1.050***	−1.064***	−1.074***	−1.076**	2.400*	2.339***	1.544**	1.732	0.460*	0.460 (1.49)	0.283	0.286
	(−0.78)	(−3.04)	(−0.89)	(−0.53)	(−2.75)	(−3.58)	(−3.11)	(−2.31)	(1.87)	(3.52)	(2.06)	(1.60)	(1.73)		(1.05)	(1.24)
R&D	−1.001	−0.207	−0.920	−0.097	−2.473	−3.001	−2.501	−3.053	−0.941**	−0.139***	−0.785**	−0.541***	−0.070**	−0.009**	−0.057**	−0.175**
	(−1.43)	(−1.19)	(−1.54)	(−1.33)	(−1.59)	(−1.37)	(−1.22)	(−0.94)	(−2.37)	(−3.22)	(−2.46)	(−4.13)	(−2.38)	(−1.97)	(−2.20)	(−2.33)
Constant	10.597***	10.207***	10.515***	11.091***	11.765***	11.509***	11.888***	12.166***	3.151***	2.907***	0.130***	−1.728***	1.208***	1.287***	−0.489***	−0.569***
	(3.60)	(4.58)	(5.61)	(4.56)	(3.83)	(5.07)	(3.76)	(6.72)	(5.43)	(4.11)	(3.66)	(−3.50)	(4.25)	(3.80)	(−5.82)	(−3.65)
Obs.	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445	2455	2445	2445
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.32	0.36	0.40	0.40	0.34	0.32	0.38	0.27	0.44	0.38	0.41	0.38	0.29	0.39	0.38	0.38
F-value	10.94	10.74	10.87	11.04	40.11	39.94	39.96	40.08	2.83	1.76	4.08	2.62	3.27	4.27	3.25	4.42

Notes: T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 1 fully defines all the variables used.

Table 5
Fixed-effects regression results of the relationship between executive remuneration and firm performance.

Dep. Variable	ROA	ROA	TOBINQ	TOBINQ
Ind. Variables	(1)	(2)	(3)	(4)
CEO Pay	0.005***		0.013***	
	(2.83)		(2.65)	
TER		0.001**		0.059*
		(2.51)		(1.68)
BSIZE	0.016**	0.015**	0.034**	0.053*
	(2.59)	(2.40)	(2.07)	(1.98)
INDEP	−0.009	−0.008	−0.007	−0.007
	(0.40)	(−1.06)	(−0.66)	(−0.69)
NBMs	−0.008	−0.007	0.230	0.245
	(−0.23)	(−0.23)	(0.53)	(0.57)
BIG4	−0.011	−0.064	−0.067	−0.039
	(−0.08)	(−0.44)	(−0.97)	(−1.02)
AGE	0.029***	0.032**	0.312**	0.361***
	(3.85)	(2.35)	(2.32)	(3.30)
FSIZE	0.101***	0.008**	0.033**	0.031***
	(3.13)	(2.43)	(2.11)	(2.94)
LEV	−0.274***	−0.289***	−1.498**	−1.485**
	(4.40)	(−4.66)	(−2.18)	(2.39)
CAP	0.131**	0.129**	−0.462**	−0.522
	(2.59)	(2.58)	(−2.08)	(−0.89)
R&D	−0.606	−0.614	−0.071	−0.206
	(−1.23)	(−1.25)	(−1.06)	(−1.20)
Constant	0.026***	0.133***	1.413***	1.943***
	(4.40)	(3.35)	(4.84)	(2.95)
Obs.	2445	2445	2445	2445
Dummies	Yes	Yes	Yes	Yes
R-Squared	0.34	0.43	0.35	0.39
F-value	8.30	9.47	9.70	9.58

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

economic implication of this evidence is that a one standard deviation increase (decrease) in CCGD will be associated with about a 0.099 (0.498*0.20) decrease (increase) in the TER. Furthermore, CCDI in Column (8) shows a strong negative relationship with the TER (−0.345, $p < 0.05$), thus, H1 is supported. The finding suggests that a one standard deviation increase (decrease) in CCDI will be associated with about a 0.048 (0.345*0.14) increase (decrease) in the TER-implying that the evidence is economically significant. Together, our findings are largely consistent with prior research that examines the relationship between board diversity and ER (Bugeja et al., 2016; Sarhan et al., 2019; Tee, 2021; Zhu et al., 2021). However, one strand of prior research (e.g., Harakeh et al., 2019; Sarhan et al., 2019; Tee, 2021) examines the effect of board gender diversity on ER, whilst another strand investigates the impact of gender-diverse compensation committees on CEO Pay (Bugeja et al., 2016). A closely related study examines the effect of age dissimilarity on the Chair-CEO pay gap (Zhu et al., 2021). In our study, we employ both Chair-CEO age and Chair-CEO gender diversity, and CEO Pay and ER to explore how diversity among two crucial roles (Chair, CEO) affects ER in a combined investigation. Accordingly, we provide direct support for the argument that Chair-CEO diversity can contribute to reducing excessive ER by lowering both CEO Pay and TER.

Table 4, Columns (9) to (16) report the fixed-effects regression results of the effect of the various Chair-CEO diversity variables on FP, as measured by accounting return (ROA) and firm value (Tobin's Q). First, to determine the effect of CCAD on FP, we regress CCAD on ROA and the control variables in Column (9), whereas Column (13) provides the results of regressing CCAD on Tobin's Q. These results in Column (9) and Column (13) show that CCAD has an insignificant relationship with ROA and Tobin's Q, respectively, implying that our second hypothesis is not supported. This suggests that age difference between the Chair and CEO has weak impact on ROA and Tobin's Q.

Second, Columns (10) and (14) of Table 4 show that CCGP has a positive and significant effect on both accounting return (ROA) and firm value (Tobin's Q) at the 5% level, offering support for our second hypothesis. Precisely, the results in the table (Column 10) show that CCGP has a positive effect on the ROA (0.046, $p < 0.10$); hence, H2 is empirically supported. The economic implication of this result is that a one standard deviation increase (decrease) in CCGP will be associated with about a 0.016 (0.046*0.35) decrease (increase) in the ROA. Furthermore, the results in the table (Column 14) reveal that CCGP has positive effect on Tobin's Q (0.046, $p < 0.10$), implying H2 is supported. The economic significance of this evidence is that a one standard deviation increase (decrease) in CCGP will be associated with about a 0.016 (0.046*0.35) decrease (increase) in Tobin's Q.

Third, to investigate the impact of CCGD on FP, we regress CCGD on ROA in Column (11), whilst Column (15) presents the results of regressing CCGD on Tobin's Q. Our results in Columns (11) and (15) show that CCGD has a positive and significant effect on ROA and Tobin's Q, respectively, thus providing additional support to our second hypothesis. Specifically, CCGD in Column (11) is positively associated with the ROA (1.668, $p < 0.001$). Economically, the result is significant because it suggests that a one-standard deviation increase (decrease) in CCGD will be associated with about a 0.334 (1.668*0.20) increase (decrease) in the ROA. These findings again support H2. The results in Column (12) show that CCDI has positive effect on the ROA (4.029, $p < 0.001$). This provides empirical support for H2. The economic significance of this result is that a one standard deviation increase (decrease) in CCDI will be associated with about a 0.564 (4.029*0.14) decrease (increase) in the ROA. Next, the results in Column (15) of Table 4 show that CCGD has positive impact on the Tobin's Q (0.091, $p < 0.050$). This evidence indicates that H2 is empirically supported. The finding suggests that a one standard deviation increase (decrease) in CCGD will be associated with about a 0.018 (0.091*0.20) increase (decrease) in the Tobin's Q-suggesting that the evidence is economically significant. This result is consistent with prior studies that examine the effect of board gender diversity on FP (e.g., Adams & Ferreira, 2009; Gyapong et al., 2016; Liu et al., 2014; Sarhan et al., 2019; Terjesen et al., 2015). Although these studies did not focus on gender diversity on the basis of the Chair and the CEO, the findings reaffirm the suggestion that Chair-CEO gender diversity creates cognitive conflicts which enhance board independence and monitoring function, and with beneficial impact on FP.

Fourth, Columns (12) and (16) show that CCDI is positively and significantly associated with ROA and Tobin's Q, respectively. The results in Column (16) of Table 4 reveal that CCDI has a positive effect on the Tobin's Q (0.870, $p < 0.001$); hence, H2 is empirically supported. The economic significance of this result is that a one standard deviation increase (decrease) in CCDI will be associated with about a 0.122 (0.870*0.14) decrease (increase) in the Tobin's Q, thus offering empirical support to H2. Overall, these findings offer support to our second hypothesis and the theoretical predictions that a substantial age gap and gender diversity can increase cognitive conflicts between the Chair and the CEO, which can be beneficial in terms of improving boards' monitoring role with valuable positive impacts on FP. Together, these results reaffirm prior studies that establish positive impact of board gender diversity on FP (Adams & Ferreira, 2009; Liu et al., 2014; Sarhan et al., 2019; Terjesen et al., 2015). In particular, our findings corroborate the suggestion by Sarhan et al. (2019) that female directors are more likely to provide a better monitoring function which can align the interest of corporate executives with shareholders through improved FP.

4.2. Results for executive remuneration and firm performance

Table 5 reports the regression results of the effect of executive remuneration (ER) on the firm performance (FP) variables. The results in Column (1) show that CEO Pay has a positive effect on the ROA (0.005, $p < 0.001$), thereby offering empirical support to H3. The economic significance of this result is that a one standard deviation increase

(decrease) in CEO Pay will be associated with about a 0.012 (0.005*2.45) decrease (increase) in the ROA. Furthermore, the results in the table (Column 2) reveal that TER has positive effect on ROA (0.001, $p < 0.050$), thus providing support to H3. The economic significance of this evidence is that a one standard deviation increase (decrease) in TER will be associated with about a 0.003 (0.001*3.12) decrease (increase) in ROA.

Further, the results in Column (3) of Table 5 show that CEO Pay has a positive impact on the Tobin's Q (0.013, $p < 0.001$), suggesting that H3 is empirically support. The finding suggests that a one standard deviation increase (decrease) in CEO Pay will be associated with about a 0.032 (0.013*2.45) increase (decrease) in the Tobin's Q-suggesting that the evidence is economically significant. In addition, the results in Column (4) of Table 5 also reveal that TER has a positive effect on the Tobin's Q (0.059, $p < 0.10$). The results provide empirical support to H3. The economic significance of this result is that a one standard deviation increase (decrease) in TER will be associated with about a 0.184 (0.059*3.12) decrease (increase) in the Tobin's Q. Together, these findings support the view that compensation incentives can enhance CEOs and corporate executives' efforts to improve FP (Zoghlami, 2021). This is consistent with prior studies that observe that an increase in CEO and TER can lead to improvement in accounting-based firm performance and market value (Adu, 2022; Sarhan et al., 2019; Zoghlami, 2021).

4.3. Results of moderating effect of Chair-CEO diversity the pay-performance nexus

Prior literature has documented that the simultaneous use of CG mechanism, through both enhanced monitoring and executive remuneration incentives (ER), can have a beneficial impact of FP, due to proper alignment of executive interests with shareholders (Adu, Al-Najjar, & Sitthipongpanich, 2022; Sarhan et al., 2019). Thus, we posit that Chair-CEO diversity will moderate the relationship between ER and FP. To test this preposition (H4), we create interaction variables between the Chair-CEO diversity variables and CEO Pay (CCAD*CEO Pay, CCGP*CEO Pay, CCGD*CEO Pay and CCDI*CEO Pay) and estimate Eq. 3. Table 6 shows the fixed-effects regression results of the moderating effect of Chair-CEO diversity on its association with accounting return (ROA) and firm value (Tobin's Q). The results presented in Table 6 indicate that the interaction variables (CCGP*CEO Pay, CCGD*CEO Pay and CCDI*CEO Pay) are all positively and significantly associated with ROA and Tobin's Q, indicating strong evidence that Chair-CEO diversity moderates the CEO-FP relationship. Thus, H4 is supported. However, the moderating impact of CCAD*CEO Pay on FP (ROA and Tobin's Q) is positive but insignificant.

Moving on to our next analysis, we argue that Chair-CEO diversity will moderate the relationship between TER and FP. To empirically test

Table 6
Fixed-effects regression results of CEO Pay, firm performance, and the moderating effect of Chair-CEO diversity.

Dep. variable	ROA	ROA	ROA	ROA	TOBINQ	TOBINQ	TOBINQ	TOBINQ
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CEO PAY	0.064	0.005***	0.025*	0.292 (1.34)	0.006**	0.011	0.012	0.001
	(1.07)	(3.58)	(1.66)		(2.08)	(0.84)	(0.63)	(0.28)
CCAD	0.089				0.009			
	(0.72)				(0.74)			
CCAD*CEO PAY	0.007				0.001			
	(1.53)				(0.30)			
CCGP		0.046*				0.143*		
		(1.81)				(1.72)		
CCGP*CEO PAY		0.003***				0.020*		
		(2.72)				(1.71)		
CCGD			1.940***				0.114	
			(3.37)				(1.47)	
CCGD*CEO PAY			0.048***				0.002**	
			(2.67)				(2.50)	
CCDI				5.595***				0.044*
				(3.41)				(1.67)
CCDI*CEO PAY				0.278**				0.101**
				(2.25)				(1.98)
BSIZE	0.140***	0.016***	0.768***	0.260***	0.027**	0.021***	0.027***	0.031***
	(3.47)	(3.29)	(3.74)	(2.96)	(2.41)	(4.62)	(2.86)	(3.00)
INDEP	−0.005 (−0.70)	−0.001 (−0.44)	−0.007 (−0.82)	−0.014 (−0.57)	−0.008	−0.007	−0.007	−0.007
					(−0.35)	(−0.68)	(−0.52)	(−0.75)
NBMs	0.241 (1.63)	0.008 (1.34)	0.267 (1.51)	0.167 (1.08)	0.230	0.231	0.230	0.230
					(0.92)	(1.57)	(1.26)	(1.44)
BIG4	−1.683 (−1.05)	−0.011 (−0.82)	−0.762 (−1.22)	−0.978 (−1.57)	−0.028	−0.069	−0.071	−0.067
					(−0.70)	(−1.37)	(−1.04)	(−1.18)
AGE	0.615**	0.028***	0.560***	0.641**	0.313***	0.315***	0.313***	0.312***
	(2.11)	(2.73)	(3.44)	(2.50)	(3.07)	(3.63)	(3.45)	(2.86)
FSIZE	0.078***	0.010***	0.096*** (4.02)	0.079***	0.032***	0.033***	0.033***	0.033***
	(3.46)	(2.81)		(2.98)	(3.05)	(3.46)	(3.15)	(4.70)
LEV	−2.933***	−0.272***	−3.745** (−2.17)	−3.534**	−1.495***	−1.499***	−1.504***	−1.500**
	(−4.20)	(−3.53)		(−2.05)	(−3.60)	(−2.73)	(−3.62)	(−2.36)
CAP	2.481* (1.75)	0.133*** (4.37)	1.619*** (3.22)	1.687 (1.11)	0.448**	0.460**	0.468**	0.463*
					(2.27)	(2.03)	(2.34)	(1.73)
R&D	−0.935**	−0.649***	−6.353**	−0.608***	−0.068***	−0.012**	−0.078***	−0.100**
	(−3.73)	(−3.01)	(−1.98)	(−3.35)	(−2.73)	(−2.21)	(−4.37)	(−2.40)
Constant	3.210***	0.029***	−0.474***	−3.181***	1.361***	1.451**	1.447***	1.368**
	(4.97)	(3.85)	(−4.96)	(−3.27)	(4.32)	(2.10)	(6.73)	(2.26)
Obs.	2445	2445	2445	2445	2445	2445	2445	2445
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.41	0.31	0.30	0.30	0.29	0.37	0.28	0.35
F-value	3.19	8.04	4.04	2.45	3.25	4.21	3.85	4.26

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

this assertion, we create an interaction variable between the Chair-CEO diversity variables and TER (CCAD*TER, CCGP*TER, CCGD*TER and CCDI*TER) and re-estimate Eq. 3. Table 7 presents the fixed-effects regression results of the moderating effect of Chair-CEO diversity on the association between TER and FP (ROA and Tobin's Q). The results show that the interaction variables (CCGP*TER, CCGD*TER and CCDI*TER) have positive and significant relationship with ROA and Tobin's Q, demonstrating that Chair-CEO diversity moderates the TER-FP nexus. This offers further support for H4. These findings show that cognitive conflicts caused by Chair-CEO diversity increase the intensity of the board's monitoring role and limit the power that CEOs and corporate executives have in setting their own pay. Thus, Chair-CEO diversity can provide a suitable channel to properly align the interests of corporate executives and shareholders with beneficial impact on FP (Adu, Flynn, & Grey, 2022c). By contrast, the moderating impact of CCAD*TER on FP (ROA and Tobin's Q) while positive is weak.

4.4. Additional analyses

The prior literature suggests that board monitoring propensity influences CG practices such as gender diversity between the Chair and the CEO (Adu, Al-Najjar, & Sitthipongpanich, 2022; Elmagrhi et al., 2019). In particular, Elmagrhi et al. (2019) maintain that having female in key roles, such as Chair or CEO, can substantially enhance the monitoring role of the board as women tend to possess superior monitoring capacity than men. In this regard, it is interesting to focus on the female Chair and female CEO contexts when assessing the impact of Chair-CEO diversity attributes on ER and FP. Thus, we perform female as Chair and female as CEO sample analyses.

First, we estimate whether the predicted associations differ when the Chair of the board is a female. We employ the dummy variable FCHAIR, which equals one if the Chair of the board is a female, and zero otherwise. The results in Table 8, Panel A, Columns 1–4 show that the coefficient on the interaction variables between the Chair-CEO diversity variables and FCHAIR variable (CCGP*FCHAIR, CCGD*FCHAIR and CCDI*FCHAIR) are negative, indicating that the negative impact of Chair-CEO diversity on CEO Pay is stronger for firms with a female as Chair. Further, FCHAIR is negatively related to CEO Pay, suggesting that firms with female as Chair have lower CEO Pay. The results in Panel A, Columns 5–8 in Table 8 also reveal that the coefficient of CCGP*FCHAIR, CCGD*FCHAIR, and CCDI*FCHAIR are negative and significant, implying that the negative effect of Chair-CEO diversity on TER is greater for firms with female Chairs. In addition, FCHAIR has a negative and significant impact on TER, indicating that firms with female Chairs are associated with lower TER. Altogether, the results imply that in firms with Chair-CEO diversity, having female as Chair can lower

Table 7
Executive remuneration, firm performance, and the moderating effect of Chair-CEO diversity.

Dep. variable	ROA	ROA	ROA	ROA	TOBINQ	TOBINQ	TOBINQ	TOBINQ
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EXREM	0.030	0.068	0.100	0.016	0.051	0.059*	0.060*	0.124 (1.36)
	(0.76)	(1.09)	(0.84)	(0.37)	(0.11)	(1.78)	(1.67)	
CCAD	0.111				0.016			
	(1.58)				(0.53)			
CCAD*TER	0.006				0.002			
	(1.62)				(1.37)			
CCGP		0.306*				0.081* (1.69)		
		(1.85)						
CCGP*TER		0.006*				0.001***		
		(1.71)				(3.24)		
CCGD			1.062***				0.150*	
			(2.97)				(1.73)	
CCGD*TER			0.116***				0.001*** (3.04)	
			(3.47)					
CCDI				3.279*				0.040* (1.81)
				(1.73)				
CCDI*TER				0.895***				0.017** (2.08)
				(3.20)				
BSIZE	0.159***	0.041***	0.795***	0.323***	0.046***	0.042***	0.044***	0.048***
	(3.47)	(3.38)	(2.87)	(3.79)	(4.36)	(3.07)	(2.96)	(3.43)
INDEP	−0.004 (−0.36)	−0.008 (−0.72)	−0.006 (−0.51)	−0.015	−0.007 (−0.42)	−0.007 (−0.69)	−0.008	−0.007 (−0.87)
				(−0.38)			(−0.53)	
NBMs	0.180 (1.03)	0.118 (1.25)	0.221 (1.57)	0.123 (1.26)	0.243	0.244 (0.78)	0.241**	0.245 (0.46)
					(0.67)		(2.42)	
BIG4	−1.811 (−0.75)	−1.060	−0.804 (−0.36)	−0.983 (−0.50)	−0.018 (−0.33)	−0.042 (−0.95)	−0.044	−0.042 (−1.03)
		(−0.58)					(−0.67)	
AGE	0.494**	0.544***	0.465***	0.535**	0.367***	0.369**	0.367***	0.361***
	(1.97)	(4.62)	(3.69)	(2.31)	(3.80)	(2.00)	(4.16)	(3.58)
FSIZE	0.052***	0.035***	0.059*** (4.15)	0.055***	0.031***	0.030**	0.031***	0.031***
	(4.59)	(3.68)		(3.02)	(2.81)	(2.27)	(3.44)	(3.06)
LEV	−2.882***	−2.887***	−3.704** (−2.05)	−3.431**	−1.486***	−1.486***	−1.491***	−1.489***
	(−3.66)	(−2.90)		(−2.37)	(−4.06)	(3.69)	(−4.27)	(−2.60)
CAP	2.419* (1.76)	2.279*** (3.47)	1.526*** (3.39)	1.681 (1.47)	0.510** (1.97)	0.520 (1.46)	0.527	−0.524 (−0.75)
							(0.90)	
R&D	−0.591**	−0.878***	−6.016**	−0.891***	−0.245**	−0.193**	−0.247***	−0.267**
	(−3.46)	(−3.63)	(−4.30)	(−3.47)	(−2.36)	(−2.31)	(−3.46)	(−3.31)
Constant	2.840***	2.707***	−0.816***	−1.433***	1.853***	2.018***	2.034***	1.823***
	(4.50)	(3.79)	(−3.67)	(−3.64)	(4.85)	(3.71)	(3.63)	(4.58)
Obs.	2445	2445	2445	2445	2445	2445	2445	2445
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.38	0.33	0.28	0.35	0.32	0.37	0.39	0.34
F-value	3.21	3.18	3.35	2.43	4.89	3.27	5.58	2.28

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10%. level, respectively. Table 1 fully defines all the variables used.

Table 8
Additional analysis: Chair-CEO diversity and executive remuneration in female Chair and female CEO samples.

Additional analysis	Female as a Chair				Female as a Chair			
Panel A: Impact of Chair-CEO diversity on ER	CEO PAY (1)	CEO PAY (2)	CEO PAY (3)	CEO PAY (4)	TER (5)	TER (6)	TER (7)	TER (8)
CCAD	−0.017				−0.004			
	(−1.10)				(−0.06)			
CCAD*FCHAIR	−0.045				−0.007			
	(−1.53)				(−1.42)			
CCGP		−0.550*				−0.031* (1.70)		
		(−1.82)						
CCGP*FCHAIR		−0.876***				−0.567**		
		(−2.75)				(−2.18)		
CCGD			−0.493**				−0.528**	
			(−2.31)				(−2.19)	
CCGD*FCHAIR			−0.955***				−0.843**	
			(4.98)				(−2.30)	
CCDI				−0.701**				−0.420*
				(−2.46)				(−1.72)
CCDI*FCHAIR				−1.087***				−0.654**
				(−3.42)				(−2.16)
FCHAIR	−0.057*	−0.072***	−0.068**	−0.081**	−0.040	−0.051***	−0.062**	−0.079**
	(1.74)	(−3.24)	(−2.34)	(−2.07)	(−1.55)	(−3.44)	(−2.01)	(−2.43)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2445	2445	2445	2445	2445	2445	2455	2445
R-squared	0.38	0.34	0.45	0.42	0.37	0.33	0.35	0.31
Panel B: Impact of Chair-CEO diversity on ER	Female as a CEO				Female as a CEO			
	CEO PAY (1)	CEO PAY (2)	CEO PAY (3)	CEO PAY (4)	TER (5)	TER (6)	TER (7)	TER (8)
CCAD	−0.015				−0.005			
	(−0.97)				(−0.02)			
CCAD*FCEO	−0.030				−0.004			
	(−1.40)				(−1.30)			
CCGP		−0.489*				−0.051* (1.84)		
		(−1.73)						
CCGP*FCEO		−0.782***				−0.480**		
		(−2.04)				(−2.34)		
CCGD			−0.511**				−0.504**	
			(−2.48)				(−2.11)	
CCGD*FCEO			−0.790**				−0.647**	
			(−2.52)				(−2.51)	
CCDI				−0.620**				−0.474*
				(−2.31)				(−1.78)
CCDI*FCEO				−0.849***				−0.519**
				(−2.90)				(−2.30)
FCEO	−0.052*	−0.060***	−0.074**	−0.065**	−0.055	−0.062**	−0.059**	−0.071**
	(1.68)	(−2.91)	(−2.11)	(−2.36)	(−1.49)	(−2.30)	(−2.18)	(−2.50)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2445	2445	2445	2445	2445	2445	2455	2445
R-squared	0.35	0.32	0.41	0.40	0.35	0.30	0.32	0.29

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

pay levels.

Second, we repeat the estimations when the CEO is female. We employ the dummy variable FCEO, which equals one if the CEO of the firms is female, and zero otherwise. The results in Table 8, Panel B, Columns 1–4 report the coefficient on the interaction variables between the Chair-CEO diversity and FCEO (CCGP*FCEO, CCGD*FCEO and CCDI*FCEO) are negative, indicating that the negative effect of Chair-CEO diversity on CEO Pay is stronger for firms with a female as CEO. In addition, FCEO is negatively related to CEO Pay, suggesting that firms with female as CEO tend to have lower CEO Pay. The results in Columns 5–8 of Panel B of Table 8 also reveal that the coefficient of CCGP*FCEO, CCGD*FCEO, and CCDI*FCEO are negative and significant, indicating that the negative effect of Chair-CEO diversity on TER is greater for firms with female CEO. In addition, FCEO has negative relationship with TER, indicating that firms with a female CEO are associated with lower TER. These results demonstrate the importance of Chair-CEO diversity in reducing ER. Overall, Panel A and B of Table 9 shows that the negative impact of Chair-CEO diversity on ER is more prominent for FCHAIR, indicating that female Chairs can serve as a crucial instrument in limiting excessive ER.

Third, we estimate Eq. (2) for the FCHAIR and FCEO samples to consider whether the predicted associations of Chair-CEO diversity and FP will differ when the Chair is a female, or when the CEO is a female. The results reported in Table 9 show that the positive impact of Chair-CEO diversity (CCGP, CCGD and CCDI) on FP (ROA and TOBINQ) is more pronounced for FCHAIR than FCEO and the main samples, indicating that firms with female Chairs are associated with higher FP owing to superior board oversight of role.

Fourth, we repeat the estimations of the moderating effect of Chair-CEO diversity on the ER-FP relationship for FCHAIR and FCEO samples. The results in Table 10, Panel A show that the positive impact of the Chair-CEO diversity on the CEO Pay-FP nexus is more prominent for FCHAIR, suggesting that the moderating effect of Chair-CEO diversity on the ER-FP relationship is enhanced in firms with female Chairs. This offers additional empirical support to our initial findings.

Finally, we estimate the moderating effect of Chair-CEO diversity on

Table 9
Additional analysis: Chair-CEO diversity and firm performance in female Chair and female CEO samples.

Additional analysis	Female as Chair				Female as Chair			
Panel A: Effects of Chair-CEO diversity on FP	ROA (1)	ROA (2)	ROA (3)	ROA (4)	TOBINQ (5)	TOBINQ (6)	TOBINQ (7)	TOBINQ (8)
CCAD	0.029				0.007			
	(0.60)				(1.20)			
CCAD*FCHAIR	0.048				0.005			
	(1.36)				(1.56)			
CCGP		0.037 (1.58)				0.019* (1.80)		
CCGP*FCHAIR		0.087**				0.055* (1.70)		
		(2.05)						
CCGD			0.842* (1.79)				0.037* (1.69)	
CCGD*FCHAIR			2.35***				0.089**	
			(3.54)				(2.50)	
CCDI				1.032** (2.43)				0.025* (1.81)
CCDI*FCHAIR				4.857***				0.107**(2.40)
				(3.02)				
FCHAIR	0.084	0.027* (1.81)	0.095**	0.040* (1.77)	0.009	0.003* (1.71)	0.036**	0.050** (1.98)
	(0.72)		(2.49)		(1.26)		(2.44)	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2445	2445	2445	2445	2445	2445	2445	2445
R-squared	0.40	0.35	0.41	0.39	0.30	0.36	0.35	0.29
Panel B: Effects of Chair-CEO diversity on FP	Female as CEO				Female as CEO			
	ROA (1)	ROA (2)	ROA (3)	ROA (4)	TOBINQ (5)	TOBINQ (6)	TOBINQ (7)	TOBINQ (8)
CCAD	0.042				0.002			
	(0.83)				(1.37)			
CCAD*FCEO	0.056				0004 (1.06)			
	(1.31)							
CCGP		0.061 (1.35)				0.022 (1.51)		
CCGP*FCEO		0.040* (1.82)				0.042* (1.72)		
CCGD			0.510* (1.76)				0.042* (1.76)	
CCGD*FCEO			1.864**				0.084**	
			(2.39)				(2.11)	
CCDI				0.982* (1.65)				0.039* (1.67)
CCDI*FCEO								0.051** (1.92)
FCEO	0.053	0.036 (1.57)	0.062* (1.78)	0.019* (1.86)	0.004	0.015**	0.075**	0.064***
	(1.20)				(1.47)	(2.36)	(1.99)	(3.27)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2445	2445	2445	2445	2445	2445	2445	2445
R-squared	0.38	0.32	0.42	0.35	0.31	0.35	0.37	0.39

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

the TER-FP nexus for FCHAIR and FCEO sub-samples. The results demonstrate that the positive effect of Chair-CEO diversity on the TER-FP relationship is more pronounced in firms with female Chairs, (for brevity, results are not reported but are available upon request).

4.5. Robustness checks

We conduct a number of additional analyses in order to test the robustness of our findings. First, we examine the relationship between ER and FP, and the number of female directors on the board.[2] Results reported in Columns (1) to (3) in Table 11 show that appointing one female director (GEN_1), and two female directors (GEN_2) both have a positive but insignificant impact on ROA. Interestingly, increasing the female directors to more than two (GEN_3) have positive and significant effect on ROA which supports critical mass theory. The evidence demonstrates that board diversity on the basis of gender increases FP as measured by ROA. Similarly, the result in Table 11, Column (6) indicates that board diversity on the basis of gender (BGD_3) is positively associated with ROA.

Our results reported in Table 11, Columns (7) to (9) indicate that the existence of two female directors (GEN_2), and more than two females (GEN_3) are both positively and significantly associated with Tobin's Q. Similar results were obtained when diversity was defined as percentage of female directors on board. The results show that BGD_2 and BGD_ 3 have a positive and significant impact on Tobin's' Q. Our results are robust to the use of both the percentage of gender diversified directors (BGD) and the board gender diversity dummy measure (GEN). These findings offer empirical support that board diversity on the basis of gender has beneficial impact on firm value as established by prior studies (Sarhan et al., 2019).

Second, and following well-established literature (e.g., Ahmed et al., 2021; Liu et al., 2014; Sarhan et al., 2019), the relationship between Chair-CEO diversity and firm performance is re-investigated using return on equity (ROE) and earnings per share (EPS) as alternative accounting return and market value measures, respectively. Prior research has employed EPS as a measure of firm value as it captures earnings shareholders receive relative to their shares in the firm (Adu, 2023b; Qureshi, Kirkerud, Theresa, & Ahsan, 2020; Bin Khidmat, Ayub Khan, & Ullah, 2020). The results in Table 12, Columns (2) to (4) and (6) to (10), show that the Chair-CEO diversity measures have positive and

[2] Following, Sarhan et al. (2019), Gyapong et al. (2016), and Liu et al. (2014), Equation 2 was re-estimated using the following variables: a dummy variable equal to 1 if a firm has one woman director on the board (GEN_1); a dummy variable equal to 1 if a firm has two woman directors on the board (GEN_2); a dummy variable equal to 1 if a firm has more than two woman directors on the board (GEN_3); a firm with 1 female director expressed as percentage of total directors (BGD_1); a firm with two female directors expressed as percentage of total directors (BGD_2) and a firm with more than two directors expressed as the percentage of the total number of directors (BGD_3).

Table 10
Additional analysis: CEO Pay, firm performance, and the moderating effect of Chair-CEO diversity in female Chair and female CEO samples.

Additional analysis	Female as a Chair				Female as a Chair			
Panel A: Impact of Chair-CEO diversity on CEO PAY-FP link	ROA (1)	ROA (2)	ROA (3)	ROA (4)	TOBINQ (5)	TOBINQ (6)	TOBINQ (7)	TOBINQ (8)
CEO PAY	0.053 (1.21)	0.009*** (3.46)	0.041* (1.70)	0.357 (1.48)	0.036** (2.18)	0.053 (0.69)	0.035 (0.71)	0.005 (0.47)
CCAD*FCAHIR	0.064 (0.97)				0.005 (0.67)			
CCAD*CEO PAY*FCHAIR	0.050 (1.49)				0.008 (0.42)			
CCGP*FCHAIR		0.054* (1.75)				0.173** (2.32)		
CCGP*CEO PAY*FCAHIR		0.038** (2.42)				0.087* (1.80)		
CCGD*FCHAIR			1.673*** (3.48)				0.124 (1.52)	
CCGD*CEO PAY*FCAHIR			1.850*** (3.04)				0.050** (2.47)	
CCDI*FCHAIR				4.463*** (4.20)				0.036* (1.82)
CCDI*CEO PAY*FCHAIR				0.305** (2.46)				0.047** (2.03)
FCAHIR	0.055 (0.40)	0.014 (1.54)	0.082* (1.68)	0.051* (1.71)	0.010 (1.09)	0.001* (1.83)	0.025* (1.70)	0.066* (1.75)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2445	2445	2445	2445	2445	2445	2455	2445
R-squared	0.37	0.34	0.33	0.28	0.32	0.34	0.31	0.37
	Female as a CEO				Female as a CEO			
Panel: Impact of Chair-CEO diversity on CEO PAY-FP link	ROA (1)	ROA (2)	ROA (3)	ROA (4)	TOBINQ (5)	TOBINQ (6)	TOBINQ (7)	TOBINQ (8)
CEO PAY	0.056 (0.64)	0.083 (1.37)	0.147 (1.10)	0.042 (0.78)	0.082 (0.40)	0.046* (1.75)	0.099* (1.82)	0.156 (1.25)
CCAD*FCEO	0.127 (1.49)				0.057 (0.73)			
CCAD*CEO PAY*FCEO	0.025 (1.51)				0.004 (1.32)			
CCGP*FECO		0.042* (1.75)				0.069* (1.72)		
CCGP*CEO PAY*FCEO		0.019** (2.10)				0.032* (1.69)		
CCGD*FECO			1.150** (2.26)				0.182* (1.68)	
CCGD*CEO PAY*FCEO			1.160** (2.15)				0.012** (2.03)	
CCDI*FCEO				3.750* (1.82)				0.067* (1.70)
CCDI*CEO PAY*FCEO				0.294** (2.50)				0.031** (2.42)
FCEO	0.041 (1.08)	0.029 (1.33)	0.058* (1.69)	0.028* (1.77)	0.010 (1.04)	0.084* (1.80)	0.072** (2.01)	0.060** (2.30)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2445	2445	2445	2445	2445	2445	2445	2445
R-squared	0.41	0.36	0.44	0.37	0.30	0.38	0.32	0.37

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

significant relationships with ROE and EPS, respectively.

Third, we use an instrumental variable (IV) two-stage least squares (2SLS) technique to address any potential endogeneity. However, it is problematic to identify variables that can serve as valid instruments in our setting for Chair-CEO diversity as relevant theory is scant (Zhou et al., 2019). Addressing this and motivated by prior literature (Hwang & Kim, 2009; Miletkov, Poulsen, & Wintoki, 2014; Pathan, 2009; Sarhan et al., 2019; Zhou et al., 2019),[3] we use lagged Chair-CEO diversity and CG variables as instruments in estimating the 2SLS models. The 2SLS results reported in Table 13 are consistent with our main results.

Finally, following Sarhan et al. (2019) and Salloum, Jabbour, and Mercier-Suissa (2019), a 1-year lag between Chair-CEO diversity variables and firm performance (ROA and Tobin's Q) was estimated. The results are robust when estimating a lagged Chair-CEO diversity as contained in Table 13.

5. Conclusion

As initiatives to increase board diversity and to reduce excessive

[3] We employ the lag of the Chair-CEO variables as instruments. To make sure that the 2SLS research design is appropriate, and in line with Sarhan et al. (2006), we first carry out Durbin–Wu–Hausman exogeneity test to determine whether the Chair-CEO variables are endogenously associated with ROA and Tobin's Q. Applied to Equation 2, the results reject the null hypothesis of exogeneity, and therefore, we conclude that the 2SLS technique is appropriate.

Table 11
Sensitivity analysis of the relationship between board diversity and firm performance (Part 1).

Dep. variable	ROA	ROA	ROA	ROA	ROA	ROA	TOBINQ	TOBINQ	TOBINQ	TOBINQ	TOBINQ	TOBINQ
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GEN_1	0.562 (1.47)						0.056 (1.32)					
GEN_2		0.070 (1.38)						0.184* (1.67)				
GEN_3			0.053*** (4.07)						0.010** (2.38)			
BGD_1				0.044 (1.20)						0.004 (1.37)		
BGD_2					0.005 (0.57)						0.001** (1.97)	
BGD_3						0.055*** (4.47)						0.008*** (3.51)
BSIZE	0.188*** (2.63)	0.098*** (3.87)	0.074*** (2.59)	0.351*** (1.72)	0.131*** (3.90)	0.074*** (3.83)	0.042*** (2.76)	0.058*** (3.07)	0.030*** (2.89)	0.059*** (3.67)	0.047*** (2.36)	0.029*** (3.47)
INDEP	−0.011 (−0.87)	−0.008 (−0.39)	−0.009 (−0.74)	−0.011 (−0.18)	−0.008 (−0.56)	−0.009 (−0.48)	−0.007 (−0.59)	−0.007 (−0.84)	−0.006 (−1.25)	−0.007 (−0.58)	−0.006 (−0.47)	−0.005 (−0.60)
NBMs	0.069 (0.87)	0.181 (1.13)	0.294 (1.47)	0.078 (1.50)	0.188 (1.41)	0.294 (1.23)	0.221 (1.60)	0.223 (0.89)	0.235 (0.70)	0.222 (0.77)	0.232** (2.21)	−0.059** (−2.36)
BIG4	−0.929 (−1.32)	−1.027 (−1.60)	−0.987 (−1.53)	−1.001 (−0.28)	−0.989 (−0.17)	−0.987 (−0.54)	−0.059 (−1.00)	−0.079 (−0.92)	−0.064 (−0.45)	−0.066 (−1.62)	−0.059 (−0.74)	−0.351 (−0.49)
AGE	0.577*** (2.98)	0.607*** (3.03)	0.739*** (2.91)	0.551** (2.02)	0.614*** (2.95)	0.739*** (3.92)	0.294** (2.35)	0.284** (2.54)	0.318*** (3.36)	0.290*** (4.87)	0.298*** (3.50)	0.010*** (2.82)
FSIZE	0.065*** (3.12)	0.060*** (2.95)	0.074*** (3.73)	0.066*** (3.04)	0.063*** (4.36)	0.074*** (3.30)	0.033*** (2.59)	0.034** (2.12)	0.034** (2.08)	0.033*** (4.68)	0.033*** (2.62)	0.258*** (3.02)
LEV	−2.825*** (−3.64)	−2.930*** (−4.68)	−2.783*** (−2.75)	−2.806** (−1.97)	−2.951** (−2.50)	−2.783** (−2.02)	−1.519*** (−3.37)	−1.539*** (−4.46)	−1.540*** (−3.84)	−1.523*** (−4.17)	−1.509*** (−3.18)	−1.477*** (−2.40)
CAP	2.449* (1.70)	2.349 *** (3.02)	2.506** (2.18)	2.469* (1.76)	2.334*** (3.57)	2.506*** (4.63)	0.470* (1.91)	0.504 (1.21)	0.493 (0.87)	0.476 (0.67)	0.463 (0.87)	0.186 (0.56)
R&D	−0.211** (−2.43)	−6.027*** (−2.74)	−5.139** (−1.97)	−7.269*** (−3.51)	−5.881** (−2.04)	−0.139** (−2.56)	−0.178** (−2.11)	−0.054** (−2.32)	−0.094** (−2.53)	−0.184** (−2.38)	−0.002*** (−3.66)	−0.857*** (−2.83)
Constant	2.479*** (4.67)	2.797*** (3.82)	4.073*** (5.13)	2.017*** (3.54)	2.652*** (3.85)	4.073*** (3.52)	1.248*** (3.85)	1.258*** (3.60)	1.569*** (3.36)	1.193*** (5.75)	1.227*** (2.80)	−5.884*** (−4.52)
Obs.	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445	2445
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.39	0.35	0.37	0.29	0.32	0.27	0.35	0.42	0.32	0.34	0.29	0.27
F-value	3.21	3.17	3.18	3.19	3.19	1.99	2.27	3.26	3.10	4.27	2.26	5.90

Note. Variables are defined as follows: a dummy variable equal to 1 if a firm has one woman director on the board (GEN_1); a dummy variable equal to 1 if a firm has two woman directors on the board (GEN_2); a dummy variable equal to 1 if a firm has more than two woman directors on the board (GEN_3); a firm with 1 female director expressed as percentage of total directors (BGD_1); a firm with two female directors expressed as percentage of total directors (BGD_2) and a firm with more than two directors expressed as the percentage of the total number of directors (BGD_3). Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

Table 12
Sensitivity analysis of the relationship between board diversity and firm performance (Part 2).

Dep. variable	ROE	ROE	ROE	ROE	EPS	EPS	EPS	EPS
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CCAD	−0.008 (−1.05)				0.002 (0.37)			
CCGP		0.194** (2.26)				0.159* (1.80)		
CCGD			0.120*** (3.51)				0.202** (2.54)	
CCDI				0.267*** (2.70)				0.214*** (2.87)
BSIZE	0.207** (1.98)	0.247** (2.34)	0.326*** (2.65)	0.213*** (3.08)	0.017*** (2.75)	0.059*** (2.93)	0.022*** (3.90)	0.021*** (2.82)
INDEP	−0.003 (−0.56)	−0.002 (−0.73)	−0.005 (−0.92)	−0.002 (−0.50)	−0.004 (−0.82)	−0.004 (−0.56)	−0.003 (−0.47)	−0.004 (−0.62)
NBMs	0.035 (0.74)	0.031 (0.46)	0.368 (0.60)	0.034 (0.17)	0.042 (0.48)	−0.027 (−0.54)	0.040 (0.62)	−0.041 (−0.78)
BIG4	−0.520 (−0.67)	−0.407 (−0.18)	−0.128 (−0.55)	−0.407 (−0.82)	−0.372 (−0.21)	−0.374 (−0.83)	−0.375 (−0.77)	−0.373 (−0.54)
AGE	0.683** (2.10)	0.624*** (3.09)	0.679*** (4.40)	0.587** (2.46)	0.029** (2.35)	0.033** (2.11)	0.031*** (2.68)	0.032*** (3.76)
FSIZE	0.111** (2.47)	0.167*** (2.58)	0.109*** (3.23)	0.167*** (4.35)	0.260*** (3.44)	0.258** (1.97)	0.259*** (2.73)	0.258*** (4.87)
LEV	−1.113*** (−2.54)	−2.106*** (−3.78)	−1.122*** (−2.64)	−2.116*** (−3.57)	−1.467*** (−2.62)	−1.433*** (−3.54)	−1.456*** (−2.61)	−1.440*** (−3.95)
CAP	0.587* (1.67)	1.928*** (2.85)	0.612** (2.24)	1.933*** (3.59)	0.200* (1.67)	0.228 (0.76)	0.210 (0.65)	0.237* (1.82)
R&D	−0.648** (−2.51)	−0.259*** (−4.20)	−0.617** (−2.13)	−0.063*** (−3.66)	−2.916** (−2.89)	−2.729** (−2.43)	−2.906** (−2.12)	−2.722** (−2.05)
Constant	6.647*** (3.59)	3.804*** (5.63)	6.745*** (4.30)	3.881*** (4.11)	−5.657*** (−3.46)	−5.552*** (−3.84)	−5.616*** (−3.50)	−5.406*** (−4.71)
Obs.	2445	2445	2445	2445	2445	2445	2445	2445
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.37	0.28	0.32	0.29	0.33	0.25	0.34	0.31
F-value	6.06	6.37	6.01	6.03	15.48	15.78	15.57	15.74

Notes: Robust t-statistics (in parentheses) are based on standard errors clustered by industry and year. ***, ** and * indicate significance at 1%, 5% and 10% level, respectively. Table 1 fully defines all the variables used.

executive remuneration have become topical, policymakers have more reasons to consider the association between board diversity and corporate outcomes. The academic literature has focused on the relationship between board diversity and corporate outcomes,[4] giving little attention to how Chair-CEO diversity may impact executive remuneration and firm performance. Although prior research investigates the effect of board diversity on executive remuneration (Ahmed et al., 2021; Sarhan et al., 2019; Adams & Ferreira, 2009) and on firm performance (Sarhan et al., 2019), a limited number have examined the association between Chair-CEO diversity and executive remuneration (e.g., Zhu et al., 2021). We bridge this gap by investigating the impact of Chair-CEO diversity on both executive remuneration and firm performance.

Our findings offer strong evidence that Chair-CEO diversity is associated with lower levels of both CEO Pay and total executive remuneration. In addition, we document that Chair-CEO diversity increases firm performance as a result of the improved monitoring role of the board, arising from cognitive conflicts between the Chair and the CEO. In particular, the results of the study offer support to prior research that shows that board gender diversity strengthens governance mechanisms and can impact on the strategic decision-making of firms including improving firm performance. Our findings also reaffirm the suggestion that women in top positions can enhance both the monitoring and advisory roles of the board, with the potential to minimise CEO Pay and total executive remuneration. This is important as the UK (context of this study) promotes the appointment of women into Chair and CEO roles as part of the latest CG reforms. Departing from previous studies, we add to the literature by also identifying the possible channels through which Chair-CEO diversity may affect firm performance, and the moderating role of Chair-CEO diversity on the CEO Pay-firm performance link and total executive remuneration-firm performance nexus. Our results also show that the predicted associations differ across female as Chair (more prominent) and female as CEO samples, with relatively stronger favourable outcomes with a female Chair. This is consistent with the view that because the Chair is the leader of the board, and it can be argued that female Chair appears to be more likely to insist on high level of accountability (enforcing better links between pay and performance). In addition, a chairperson is technically "higher" than a CEO of the firm. A chairperson can appoint, evaluate, and fire the CEO. The CEO still holds the highest position in the operational structure of the company, and all other executives answer to the CEO, suggesting that a female CEO may also demand accountability and ensures that CEO Pay and ER are tied to the FP of the firms.

The study contributes to the literature in a number of ways. First, prior research examines the effect of board diversity on executive remuneration, without focusing on Chair-CEO diversity. Given that the Chair and the CEO are two dominant roles in firms, we study the role that Chair-CEO diversity can play in executive remuneration. Second, while previous research examines the impact of board diversity on the basis of gender, nationality and culture on corporate performance, little attention has been paid to diversity defined as differences between the Chair and the CEO. To better understand the link between board diversity and firm performance, we delve deeper and investigate how Chair-CEO diversity, defined as age difference, generational age gap, and gender impacts on firm performance. Third, we offer additional insights on the impact of executive remuneration on firm performance. Finally, unlike prior research that presents a direct link between board diversity and firm performance, our study provides evidence that the

[4] Examples of corporate outcomes include financial performance (Liu et al., 2014; Sarhan et al., 2019), CSR (Harjoto, Laksmana, & Lee, 2015), ESG (Adu et al., 2022a) and carbon performance (Adu et al., 2022a).

Table 13
Impact of various Chair-CEO diversity attributes on firm performance-addressing endogeneity, 2SLS and lagged models.

Type of analysis	**2SLS approach**								**Lagged models**							
Dep Variable	ROA	ROA	ROA	ROA	TOBINQ	TOBINQ	TOBINQ	TOBINQ	ROA	ROA	ROA	ROA	TOBINQ	TOBINQ	TOBINQ	TOBINQ
Ind. variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CCAD	0.015 (1.47)				0.006 (0.73)				0.022 (1.27)				0.009 (1.48)			
CCGP		0.106* (1.72)				0.085* (1.69)				0.026* (1.72)				0.092* (1.65)		
CCGD			0.884*** (3.23)				0.103** (2.42)				0.756*** (3.48)				0.110** (2.34)	
CCDI				2.801*** (2.86)				0.109** (2.22)				2.073*** (2.96)				0.200** (2.28)
BSIZE	4.440*** (3.58)	4.499*** (2.59)	3.912*** (3.72)	4.304*** (2.85)	0.049*** (3.30)	0.067*** (2.64)	0.081*** (2.80)	0.076*** (4.02)	3.023*** (2.69)	3.075*** (3.06)	2.664*** (2.65)	2.960*** (4.16)	0.002** (1.97)	0.023*** (2.58)	0.036*** (2.63)	0.031*** (3.04)
INDEP	−0.001 (−0.50)	−0.001 (−0.33)	−0.007 (−0.51)	−0.001 (−0.02)	−0.003 (−0.18)	−0.003 (−0.14)	−0.003 (−0.38)	−0.003 (−0.46)	−0.002 (−0.68)	−0.002 (−0.54)	−0.003 (−0.37)	−0.001 (−0.88)	−0.003 (−0.16)	−0.002 (−0.04)	−0.002 (−0.48)	−0.003 (−0.82)
NBMs	1.758*** (2.66)	1.765*** (3.49)	1.720*** (2.85)	1.818 (1.61)	0.003 (0.52)	0.005 (0.83)	0.006 (0.28)	0.004 (0.51)	1.428*** (2.76)	1.439** (2.53)	1.402** (2.11)	1.471** (1.97)	0.274 (1.32)	0.001 (1.05)	0.001 (0.79)	0.002 (0.35)
BIG4	−1.548 (−0.83)	−1.565 (−0.47)	−1.338 (−0.62)	−1.360 (−0.87)	−0.250 (−0.68)	−0.258 (−0.56)	−0.258 (−0.42)	−0.261 (−0.63)	−1.085 (−0.32)	−1.096 (−0.68)	−0.920 (−0.53)	−0.940 (−0.46)	−0.065 (−0.74)	−0.282 (−0.89)	−0.282 (−0.63)	−0.285 (−0.57)
AGE	0.390*** (2.72)	0.405*** (3.68)	0.465*** (3.26)	0.496*** (2.84)	0.058** (2.56)	0.064* (1.68)	0.063*** (3.85)	0.062*** (3.48)	0.428*** (2.89)	0.445*** (2.67)	0.501*** (2.62)	0.514*** (3.07)	0.022** (2.54)	0.072* (1.75)	0.071*** (2.64)	0.070*** (3.80)
FSIZE	0.387*** (3.55)	0.387*** (2.93)	0.335*** (2.80)	0.375*** (3.11)	0.020*** (2.93)	0.019** (2.01)	0.019*** (2.80)	0.019*** (2.22)	0.235*** (3.40)	0.236*** (4.52)	0.216*** (3.08)	0.236*** (2.81)	0.503*** (3.20)	0.023** (2.56)	0.022*** (3.07)	0.023*** (2.59)
LEV	−0.942* (−1.67)	−0.902* (−1.83)	−0.721*** (−4.06)	−0.480** (−2.00)	−0.928*** (−4.87)	−0.938*** (−3.64)	−0.940*** (−4.11)	−0.938*** (−2.59)	−2.018* (−1.67)	−2.091* (−1.72)	−2.091** (−2.05)	−2.292** (−3.83)	−0.474*** (−2.56)	−0.511*** (−2.85)	−0.516*** (−2.97)	−0.514*** (−2.77)
CAP	3.752*** (4.81)	3.730*** (3.05)	3.331*** (2.98)	3.129*** (4.60)	0.321* (1.87)	0.313 (0.40)	0.313 (0.58)	0.318 (0.40)	0.507*** (2.72)	0.568*** (3.05)	0.742* (1.92)	0.908** (2.25)	0.377* (1.90)	0.468 (1.63)	0.466** (2.11)	0.469** (1.98)
R&D	−0.010** (−2.50)	−0.235*** (−2.86)	−6.570** (−1.97)	−1.941** (−2.38)	−0.206** (−2.02)	−0.225** (−2.08)	−0.053** (−2.56)	−0.216** (−2.24)	−0.612** (−2.10)	−0.050** (−2.57)	−0.445** (−2.03)	−0.539** (−2.16)	−0.308** (−2.45)	−0.400** (−2.28)	−0.213** (−2.17)	−0.374** (−2.54)
Constant	2.942*** (4.89)	3.059*** (3.60)	3.142*** (5.08)	2.077*** (4.35)	0.479*** (2.84)	−1.146*** (−3.87)	−0.532*** (−3.45)	−0.629*** (−2.02)	5.171*** (2.65)	6.156*** (4.10)	4.998** (2.37)	3.422*** (3.54)	−2.547** (−2.45)	−0.269*** (−4.83)	−0.365*** (−3.50)	−0.452*** (−4.03)
Obs.	2109	2109	2109	2109	2109	2109	2109	2109	2444	2444	2444	2444	2444	2444	2444	2444
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.29	0.33	0.37	0.35	0.39	0.34	0.31	0.32	0.32	0.30	0.34	0.32	0.37	0.32	0.29	0.30
F-value	43.87	47.24	49.8	44.76	50.58	52.4	54.7	58.18								

Notes: T-statistics estimated using robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively. Table 1 fully defines all the variables used.

CEO Pay-firm performance relationship and total executive remuneration-firm performance nexus is positively moderated by Chair-CEO diversity, thus identifying the channel through which board diversity is likely to affect firm performance.

This study also makes some theoretical contributions. Firstly, this research contributes to the upper echelons perspective by examining how various Chair-CEO diversity attributes impact on ER and FP. Prior studies show that demographic differences among top executive team members can influence group thinking and processes (Zhou et al., 2019) and can determine firms' strategic choices (Shahab et al., 2018). Nevertheless, these scholars do not employ the upper echelons theory to investigate how Chair-CEO diversity can influence ER and FP. This study makes a theoretical contribution by applying upper echelons theory in testing and interpreting the results on the relationship between the various Chair-CEO diversity, ER and FP. Secondly, this study makes a theoretical contribution by employing the theory of homophily in developing the hypotheses and interpreting the results of the findings. This study is among the first to draw insights from the theory of homophily in explaining how demographic differences between the Chair and the CEO impact on executive remuneration and firm performance. The theory argues that a greater diversity between the Chair and the CEO can encourage diverse opinions, thereby strengthening the monitoring intensity of the board (e.g., Zhou et al., 2019; Zhu et al., 2021). Evidence from this study is consistent with the theoretical predictions of the theory of homophily. Thirdly, and distinct from prior studies, this investigation is also informed by a theoretical insight drawn from resource dependence theory, which suggests that only firms with a Chair and CEO from diverse demographic backgrounds will have experiences and skills needed to improve the effectiveness of the oversight role of the board and FP. The evidence of the study supports the theoretical prediction of resource dependence theory.

In addition to our findings' theoretical and empirical contributions, we also offer important practical policy implications. First, the evidence from this research has crucial practical regulatory implications, especially linked to the 2017 Hampton-Alexander Review, regarding board diversity. To that effect, when firms are undertaking board diversity policy reforms, firms in the UK have incentives to include Chair-CEO diversity in their governance disclosure recommendations, which will lead to increased corporate monitoring, and the design of appropriate executive remuneration schemes. In this case, policy makers may recommend more diversity in the board across a number of areas including age and require diversity reporting/disclosure at board level. One practical way of enhancing decision-making, including setting and assessing the CEO and other corporate executives' performance may be ensuring diversity between the Chair and the CEO. In addition, our moderating evidence indicates that policy reforms relating to better monitoring (board diversity including Chair-CEO diversity) and incentive alignment (executive remuneration) should be pursued jointly for greater effectiveness. This finding implies that having Chair-CEO diversity and pay incentives can be helpful in ensuring that UK firms deliver high financial performance that matches the pay of the CEO and the other corporate executives.

Second, concerning corporate executives, the study's findings help in the understanding of practical board decisions by revealing new dynamics that influence ER and FP. More importantly, the observed new dynamics can assist corporate executives in strategically managing their firms' ER and FP. For instance, given the evidence of the positive effect of Chair-CEO diversity on FP, this should serve as a strong motivation for corporate executives to adopt a more diverse board based on demographic features and as a crucial governance mechanism to drive the FP and market value of their firms. Third, the findings offer a strong case in recommending shareholders of firms to vote for greater diversity in executive appointments. Greater diversity is expected to facilitate effective monitoring of executives to ensure board decisions create sustainable value by limiting excessive ER. Fourth, the findings of the article have crucial implications for the recruitment policies of firms. The findings demonstrate that boards with more age and gender diversity will have more effective governance mechanisms compared with boards with less diversity. Hence, nominating committees should seek both age and gender diversity when recruiting new members to the board (who could become future Chairs or CEOs). In particular, based on the findings of the study, it is recommended that firms should adopt a promotion policy that ensures greater diversity between the Chair and the CEO in the future board appointments.

The study also has some limitations. The sample was based on firms from UK FTSE index. The index mostly comprised of larger firms that have two separate individuals occupying the role of Chair and the CEO, which is a feature of the UK Code of Governance. As a result, researchers should exercise caution when generalizing our findings to smaller firms or firms in other countries. Nevertheless, the limitation of our study offers avenues for future research employing private and/or smaller firms in developed or emerging markets. Finally, owing to data limitations, we focus on Chair-CEO diversity on the basis of age and gender. We did not consider ethnicity as a measure of Chair-CEO diversity as this information was not readily accessible either from the databases employed or manual collection from the annual reports of the firms. Further, we could not consider the variability in the educational and professional backgrounds of the Chairman-CEO, i.e., culturally, professionally among others due to data limitation. Hence, future research may offer new insights as and when such data become available.

Data availability

Data will be made available on request.

References

Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. *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. (2022). Sustainable banking initiatives, environmental disclosure and financial performance: The moderating impact of corporate governance mechanisms. *Business Strategy and the Environment, 31*(5), 2365–2399.

Adu, D. A. (2023a). How do board and ownership characteristics affect bank risk-taking? New evidence from sub-Saharan Africa. *Journal of Banking Regulation*, 1–25.

Adu, D. A. (2023b). *An examination of how sustainable business practices and firm performance are influenced by board diversity and executive compensation: the case of UK FTSE 350 non-financial firms*. Doctoral dissertation. University of Limerick.

Adu, D. A., Al-Najjar, B., & Sitthipongpanich, T. (2022). Executive compensation, environmental performance, and sustainable banking: The moderating effect of governance mechanisms. *Business Strategy and the Environment, 31*(4), 1439–1463.

Adu, D. A., Flynn, A., & Grey, C. (2022a). Psyche, gender and professional experience diversity: Board selection as a means of achieving sustainability goals. *Global Business and Management Research: An International Journal, 14*(3), 1–41.

Adu, D. A., Flynn, A., & Grey, C. (2022c). 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., Flynn, A., & Grey, C. (2023). Carbon performance, financial performance and market value: The moderating effect of pay incentives. *Business Strategy and the Environment, 32*(4), 2111–2135.

Ahmed, A., Atif, M., & Gyapong, E. (2021). Boardroom gender diversity and CEO pay deviation: Australian evidence. *Accounting and Finance, 61*(2), 3135–3170.

Allison, L., Liu, Y., Murtinu, S., & Wei, Z. (2023). Gender and firm performance around the world: The roles of finance, technology and labor. *Journal of Business Research, 154*, Article 113322.

Baixauli-Soler, J. S., Lucas-Perez, M. E., Martin-Ugedo, J. F., Minguez-Vera, A., & Sanchez-Marin, G. (2016). Executive directors' compensation and monitoring: The influence of gender diversity on Spanish boards. *Journal of Business Economics and Management, 17*(6), 1133–1154.

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.

Basu, S., Hwang, L. S., Mitsudome, T., & Weintrop, J. (2007). Corporate governance, top executive compensation and firm performance in Japan. *Pacific-Basin Finance Journal, 15*(1), 56–79.

Bebchuk, L. A., & Fried, J. M. (2003). Executive compensation as an agency problem. *Journal of Economic Perspectives, 17*(3), 71–92.

Benlemlih, M., Arif, M., & Nadeem, M. (2022). Institutional ownership and greenhouse gas emissions: A comparative study of the UK and the USA. *British Journal of Management*, 1–25.

Bin Khidmat, W., Ayub Khan, M., & Ullah, H. (2020). The effect of board diversity on firm performance: Evidence from Chinese listed companies. *Indian Journal of Corporate Governance, 13*(1), 9–33.
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.
Bugeja, M., Matolcsy, Z., & Spiropoulos, H. (2016). The association between gender-diverse compensation committees and CEO compensation. *Journal of Business Ethics, 139*(2), 375–390.
Burt, R. S. (1991). Measuring FAGE as a structural concept. *Social Networks, 13*(1), 1–34.
Byrne, D. (1971). *The attraction paradigm*. New York, NY: Academic Press.
Chow, Y. P. (2023). Chair-CEO demographic dissimilarities and firm internationalization. *Review of International Business and Strategy, 33*(2), 246–271.
Dodd, O., & Zheng, B. (2022). Does board cultural diversity contributed by foreign directors improve firm performance? Evidence from Australia. *Journal of Risk and Financial management, 15*(8), 332.
Duffhues, P., & Kabir, R. (2008). Is the pay-performance relationship always positive? Evidence from the Netherlands. *Journal of Multinational Financial Management, 18*(1), 45–60.
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.
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.
Ejaz, A., Razali, H., & Muhammad, N. T. (2019). How director remuneration impacts firm performance: An empirical analysis of executive director remuneration in Pakistan. *Borsa Istanbul Review, 19*(2), 186–196.
Elmagrhi, M. H., & Ntim, C. G. (2022). *Vice-chancellor pay and performance: The moderating effect of vice-chancellor characteristics* (pp. 1–26). Work, Employment and Society.
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.
Elmagrhi, M. H., Ntim, C. G., Wang, Y., Abdou, H. A., & Zalata, A. M. (2020). Corporate governance disclosure index-executive pay nexus: The moderating effect of governance mechanisms. *European Management Review, 17*(1), 121–152.
Fernandes, N. (2008). EC: Board compensation and firm performance: The role of independent board members. *Journal of Multinational Financial Management, 18*(1), 30–44.
Ferris, G. R., Judge, T. A., Chachere, J. G., & Liden, R. C. (1991). The FAGE context of performance-evaluation decisions. *Psychology and Aging, 6*(4), 616.
Focke, F., Maug, E., & Niessen-Ruenzi, A. (2017). The impact of firm prestige on executive compensation. *Journal of Financial Economics, 123*(2), 313–336.
Fracassi, C., & Tate, G. (2012). External networking and internal firm governance. *The Journal of Finance, 67*(1), 153–194.
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*, Article 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.
Guest, P. M. (2009). The impact of board size on firm performance: Evidence from the UK. *The European Journal of Finance, 15*(4), 385–404.
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.
Hall, B. J., & Liebman, J. B. (1998). Are CEOs really paid like bureaucrats? *The Quarterly Journal of Economics, 113*(3), 653–691.
Hallock, K. F. (1998). Layoffs, top executive pay, and firm performance. *American Economic Review*, 711–723.
Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review, 32*(2), 334–343.
Hambrick, D. C., Finkelstein, S., & Mooney, A. C. (2005). Executive job demands: New insights for explaining strategic decisions and leader behaviors. *Academy of Management Review, 30*(3), 472–491.
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. (2020). Executive compensation, sustainable compensation policy, carbon performance and market value. *British Journal of Management, 31*(3), 525–546.
Harakeh, M., El-Gammal, W., & Matar, G. (2019). Female directors, earnings management, and CEO incentive compensation: UK evidence. *Research in International Business and Finance, 50*, 153–170.
Harjoto, M., Laksmana, I., & Lee, R. (2015). Board diversity and corporate social responsibility. *Journal of Business Ethics, 132*, 641–660.
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.
Hwang, B. H., & Kim, S. (2009). It pays to have friends. *Journal of Financial Economics, 93*(1), 138–158.
Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(1976), 305–360.
Jensen, M. C., & Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of Political Economy, 98*(2), 225–264.
Jiajun, Z. H. U., Jing, G. A. O., & Hongping, T. A. N. (2020). Data of CEO power, chair-CEO age dissimilarity and pay gap of Chinese listed firms. *Data in Brief, 32*, Article 106158.
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.
Lazarsfeld, P. F., & Merton, R. K. (1954). Friendship as a social process: A substantive and methodological analysis. *Freedom and Control in Modern Society, 18*(1), 18–66.
Lee, G., Cho, S. Y., Arthurs, J., et al. (2019). CEO pay inequity, CEO-TMT pay gap, and acquisition premiums. *Journal of Business Research, 98*, 105–116.
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*, 232–250.
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.
Mahadeo, J. D., Soobaroyen, T., & Hanuman, V. O. (2012). Board composition and financial performance: Uncovering the effects of diversity in an emerging economy. *Journal of Business Ethics, 105*(3), 375–388.
Mardiyati, U., & Siregar, M. E. S. (2022). The impact of nationality diversity on financial performance among manufacturing companies listed on the Indonesia stock exchange. *Global Advances in Business Studies, 1*(1), 27–33.
Marsden, P. V. (1987). Core discussion networks of Americans. *American Sociological Review*, 122–131.
McGuire, J., Dow, S., & Argheyd, K. (2003). CEO incentives and corporate social performance. *Journal of Business Ethics, 45*(4), 341–359.
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.
Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics, 38*(2), 163–184.
Miletkov, M. K., Poulsen, A. B., & Wintoki, M. B. (2014). The role of corporate board structure in attracting foreign investors. *Journal of Corporate Finance, 29*, 143–157.
Murray, A. I. (1989). Top management group heterogeneity and firm performance. *Strategic Management Journal, 10*(S1), 125–141.
Nguyen, B. D. (2012). Does the rolodex matter? Corporate elite's small world and the effectiveness of boards of directors. *Management Science, 58*(2), 236–252.
Orazalin, N. S., Ntim, C. G., & Malagila, J. K. (2023). Board sustainability committees, climate change initiatives, carbon performance, and market value. *British Journal of Management*. https://doi.org/10.1111/1467-8551.12715. Date accessed, April 2023.
O'Reilly, C., Caldwell, D. F., & Barnett, W. P. (1989). Wok group demography, social integration, and turnover. *Administrative Science Quarterly, 34*, 21–37.
Ozkan, N. (2011). CEO compensation and firm performance: An empirical investigation of UK panel data. *European Financial Management, 17*(2), 260–285.
Pandey, N., Kumar, S., Post, C., Goodell, J. W., & García-Ramos, R. (2022). Board gender diversity and firm performance: A complexity theory perspective. *Asia Pacific Journal of Management*, 1–32.
Pathan, S. (2009). Strong boards, CEO power and bank risk-taking. *Journal of Banking and Finance, 33*(7), 1340e1350.
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.
Pfeffer, J. (1983). Organizational demography. In L. L. Cummings, & B. M. Staw (Eds.), *Vol. 5. Research in organizational behaviour* (pp. 299–357). Greenwich, CT: JAI Press.
Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York: Harper and Row.
Pham, T. D. T., & Lo, F. Y. (2023). How does top management team diversity influence firm performance? A causal complexity analysis. *Technological Forecasting and Social Change, 186*, 122162.
Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal, 58*(5), 1546–1571.
Qureshi, M. A., Kirkerud, S., Theresa, K., & Ahsan, T. (2020). The impact of sustainability (environmental, social, and governance) disclosure and board diversity on firm value: The moderating role of industry sensitivity. *Business Strategy and the Environment, 29*(3), 1199–1214.
Raharjo, P. G., Hakim, D. B., Manurung, A. H., & Maulana, T. N. (2014). The determinant of commercial banks' interest margin in Indonesia: An analysis of fixed effect panel regression. *International Journal of Economics and Financial Issues, 4*(2), 295–308.
Rashid, A. (2013). Corporate governance, executive pay and firm performance: Evidence from Bangladesh. *International Journal of Management, 30*(2), 556.
Reguera-Alvarado, N., de Fuentes, P., & Laffarga, J. (2017). Does board gender diversity influence financial performance? Evidence from Spain. *Journal of Business Ethics, 141*, 337–350.

Salloum, C., Jabbour, G., & Mercier-Suissa, C. (2019). Democracy across gender diversity and ethnicity of Middle Eastern SMEs: How does performance differ? *Journal of Small Business Management, 57*(1), 255–267.
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.
Scott, W. R. (2001). *Institutions and organizations* (2nd ed.). Sage.
Serfling, M. A. (2014). CEO FAGE and the riskiness of corporate policies. *Journal of Corporate Finance, 25*, 251–273.
Shahab, Y., Ntim, C. G., Chengang, Y., Ullah, F., & Fosu, S. (2018). Environmental policy, environmental performance, and financial distress in China: Do top management team characteristics matter? *Business Strategy and the Environment, 27*, 1635–1652.
Smith, K. G., Smith, K. A., Olian, J. D., Sims, H. P., Jr., 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.
Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review, 20*, 571–610.
Tee, C. M. (2021). Executive directors' pay-performance link and board diversity: Evidence from high free cash flow and low-growth firms. *International Journal of Emerging Markets, 18*(9), 2477–2500.
Terjesen, S., Aguilera, R. V., & Lorenz, R. (2015). Legislating a woman's seat on the board: Institutional factors driving gender quotas for boards of directors. *Journal of Business Ethics, 128*(2), 233–251.
Tosi, H. L., Misangyi, V. F., Fanelli, A., & Waldman, D. (2004). CEO charisma, compensation, and firm performance. *The Leadership Quarterly, 15*(3), 405–420.
Tosi, H. L., Werner, S., Katz, J. P., & Gomez-Mejia, L. R. (2000). How much does performance matter? A meta-analysis of CEO pay studies. *Journal of Management, 26*(2), 301–339.
Unite, A. A., Sullivan, M. J., Brookman, J., Majadillas, M. A., & Taningco, A. (2008). Executive pay and firm performance in the Philippines. *Pacific-Basin Finance Journal, 16*(5), 606–623.
Vafaei, A., Ahmed, K., & Mather, P. (2015). Board diversity and financial performance in the top 500 Australian firms. *Australian Accounting Review, 25*(4), 413–427.
Verbrugge, L. M. (1977). The structure of adult friendship choices. *Social Forces, 56*(2), 576–597.
Wagner, W. G., Pfeffer, J., & O'Reilly, C. A., III (1984). Organizational demography and turnover in top-management group. *Administrative Science Quarterly*, 74–92.
Wang, T., Song, M., & Zhao, Y. L. (2014). Legitimacy and the value of early customers. *Journal of Product Innovation Management, 31*(5), 1057–1075.
Yim, S. (2013). The acquisitiveness of youth: CEO age and acquisition behavior. *Journal of Financial Economics, 108*(1), 250–273.
Zajac, E. J., & Westphal, J. D. (1995). Accounting for the explanations of CEO compensation: Substance and symbolism. *Administrative Science Quarterly*, 283–308.
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*, Article 101221.
Zhu, J., Gao, J., & Tan, H. (2022). Mind the chair-CEO age dissimilarity: An implicit internal monitoring mechanism. *Applied Economics Letters*, 1–6.
Zoghlami, F. (2021). Does CEO compensation matter in boosting firm performance? Evidence from listed French firms. *Managerial and Decision Economics, 42*(1), 143–155.