Future Business Journal

RESEARCH Open Access

Board expertise diversity and firm performance in sub-Saharan Africa: do firm age and size matter?

Felix Kwabena Danso[1*], Michael Adusei[2], Beatrice Sarpong-Danquah[3] and Kwadwo Boateng Prempeh[1]

Abstract

Our study delved into an analysis of 128 public companies in Ghana, Kenya, and Nigeria to explore the influence of diversified board expertise on firm performance. We also investigated the impact of firm size and age on this relationship. Our results indicate that a varied blend of professional experts on corporate boards significantly boosts a company's ROA, although there is no significant effect when Tobin's Q measures firm performance. Nevertheless, we discovered that combining firm size and age negatively impacts the correlation between board expertise diversity and firm performance. Our findings support the significance of integrating agency, resource dependence, and convergence theories, implying that businesses can improve their financial performance by including an appropriate mix of expertise on their boards, especially for relatively younger small-sized firms. In contrast, more prominent and ageing firms may not see the same financial benefits. Consequently, we recommend that corporate executives and practitioners consider implementing board expertise diversity to enhance their firms' financial performance.

Keywords Diversity of expertise, Firm performance, Convergence theory, Sub-Saharan Africa, Firm size, Age

Introduction

The push for more diversity on corporate boards has grown intensely in recent years, as demonstrated by the implementation of corporate governance reforms in many countries that mandate the appointment of board members with unique skills, demographic profiles and experience specific to the companies they serve [59, 81]. Advocates for diversity argue that corporate directors from various backgrounds bring a more nuanced and comprehensive range of perspectives to the board's oversight and advisory roles. Adusei and Obeng [6], for instance, surmise that a critical element that can increase the efficacy of the board is its makeup, particularly the variety of perspectives and professional backgrounds of the board of directors. Based on resource dependence and agency theory, some authors argue that diversity can improve the board's ability to supervise operations and make decisions to enhance firm performance.

Nonetheless, compelling proof from various countries globally reveals shocking corporate governance scandals, leading to widespread criticism of the board of directors [50]. In a recent study, Vo and Le [84] cite the collapse of Silicon Bank in the USA as an example of how inadequate asset-liability management could be attributed to poor oversight of the board of directors. In developing countries, Ghana, Kenya, and Nigeria have faced similar corporate scandals over time, culminating in dire consequences for shareholders [8, 42, 76]. Undoubtedly, the ultimate responsibility lies with the directors in the boardroom, as their primary job is to oversee the company's executives to maximise shareholder wealth. They act as watchdogs in minimising misconduct [38] and as strategic counsellors tasked with guiding the company's

*Correspondence:
Felix Kwabena Danso
felixdanso@stu.edu.gh
[1] Sunyani Technical University, Post Office Box 206, Sunyani, Ghana
[2] Business School, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
[3] Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

future activities [46]. For the board to effectively fulfil these obligations, members must possess a wide variety of skills and attributes [29], including financial and legal expertise, industry-specific knowledge, and other specialised knowledge [60], which can be particularly crucial in complex or rapidly evolving industries.

Still, opinions are divided about the need for diversity of expertise on corporate boards. One school of thought argues that various experts bring invaluable intuitions and viewpoints to boardroom discussions, helping them make informed and reasoned decisions [19, 78] that can improve firm performance. On the contrary, scholars such as Lorsch [62] view the board of directors as an influential group of people who approve top management proposals and decisions without careful consideration and contribute next to nothing to the company's financial health. Nevertheless, Sako and Kubo [73] show that while appointing professional experts to corporate boards has become commonplace and relevant, studies on the association between board diversity and firm performance generally produce contradictory results [52].

More importantly, empirical studies on expertise diversity on corporate boards are still inchoate and broadly focus on a particular type of expertise [44], with few contemporary studies examining the existence of industry expertise [9, 37], financial expertise [53, 77], educational expertise [47], and legal expertise [9] on corporate boards. The results of these studies have, however, been contentious. For instance, Adeabah et al. [4] observe that gender diversity and financial expertise on corporate boards significantly impact banks' conservatism and profit quality. Sako and Kubo [73] also report that professional experts on corporate boards substantially enhance the success of Japanese businesses. However, scholars such as [18, 44] find no significant link between Tobin's Q and the variety of expertise on Australian publicly traded corporate boards. Balogh [18], however, notes that diversity of expertise in the Australian corporate boardrooms has a significant positive effect on a specific cluster of industries when ROA measures firm performance. These contradictory findings indicate that the puzzle about the impact of board expertise diversity on firm performance has yet to be fully unravelled.

Consequently, we set out to achieve two objectives with this study. First, we look at how the corpus of expertise on corporate boards impacts firms in developing countries' financial performance. Second, we investigate how a firm's size and age affect the board expertise-financial performance nexus. We have selected this econometric model to address two contentious issues that must be thoroughly investigated in the literature. First, prior research has overlooked the influence of firm size and age on the link between board expertise diversity and firm performance, with most authors [5, 76] treating them as control variables in the board diversity–firm performance nexus. In contrast, some authors treat firm size [32, 60] and age [25, 28] as crucial variables that can condition the board diversity–firm performance bond. Introducing intervening variables in the link is consistent with the suggestion by Kagzi and Guha [52], who contend that moderating variables in the nexus could provide additional insight into the board diversity-firm performance study's findings. Second, the majority of the previous studies on board expertise diversity focus on a single type of expertise, such as industry experience [37], legal [9, 34], financial [10, 77], and digital [64] expertise. However, Sako and Kubo [73] argue that corporate directors perform multiple roles, and their contribution to firm performance must consider the myriad of functions they play on the board.

Thus far, just a small number of international studies [13, 18, 44, 73] in developed countries have made an effort to thoroughly investigate the role that corporate managers' expertise plays in influencing firm performance. Aside from the fact that previous studies have been conducted in developed countries, they all focus on a single country, and, to the best of our knowledge, there are virtually no cross-country studies of this type in developing countries. Our article attempts to fill this gap by integrating the three theories of resource dependence, agency, and convergence and comprehensively examining the influence of board expertise diversity on corporate performance in three sub-Saharan African countries. Developing countries provide a unique context for the current study as they face institutional challenges that differ from those of developed countries [20, 66], such as weak corporate governance practices [49], ineffective legal frameworks [67], and pervasive corruption [12, 89].

We offer fresh perspectives and analysis to the current body of literature through the following ways: First, we shed more light on the bond between board expertise diversity and firm performance by thoroughly analysing the range of expertise corporate directors bring to the boardroom using a unique dataset of 279 listed firms from three African countries. This study shows that 14 experts are on the boards of the selected sub-Saharan countries as opposed to eleven (11) in previous Australian studies, and expertise diversity is very intense. We also demonstrate that pharmacists, agriculturalists, and politicians are on the corporate boards of publicly traded sub-Saharan firms.

Second, in recognition of the multiple roles of boardroom directors, our paper integrates the convergence, agency and resource dependence theories to explain the association between the diversity of expertise on corporate boards and firm performance in the context of

developing countries. To our knowledge, this is the first of its kind in the extant literature. Our results, which show a positive correlation between board diversity in terms of expertise and return on assets (ROA), corroborate the theoretical underpinnings of this research, especially the convergence theory, which upholds the benefits listed companies in developing countries stand to gain from implementing sound corporate governance practices [19].

Finally, previous studies [9, 18, 44, 73] examine the direct relationship between board expertise diversity and firm performance without considering potential confounding variables. Our finding that age and firm size have an adverse moderating influence on the board expertise diversity-firm performance relationship is novel because it adds new insights to the existing literature. The reason could be that large firms generally suffer from corporate rigidities, asset obsolescence, bureaucratic ossification, and rent-seeking entrenchment [57], which can negatively impact their performance. As a result, more established and ageing companies need to exercise caution when expanding the range of expertise on their boards.

The rest of the paper is organised as follows. Sect. "Literature review" focuses on the theoretical and empirical foundations of the study from which the hypotheses to be tested using regression analysis are formulated. Sect. "Methodology" discusses the study's methodology, while Sect. "Results and discussions" examines the empirical results. Sect. "Conclusions" focuses on the conclusion and recommendations of the study.

Literature review

This section is divided into two parts. In the first section, we explain the study's theoretical framework and evaluate the research on the link between board expertise diversity and firm performance. The second part reviews the literature on how firm size and size age affect the connection between board expertise diversity and firm performance.

Theoretical framework

The agency, resource dependence, and convergence theories serve as the principal axes of our investigation. Boadi and Osarfo [19] contend that while these theories have established a wide range of relationships between firm performance and observable characteristics, such as boardroom members' professional expertise and experience, in numerous studies such as [55, 87], their relevance is not firmly established.

In general, agency theory advocates for corporate boards to act as a governing mechanism to restrain agents' opportunistic behaviour [38]. This theory focuses on conflicts of interest resulting from dividing ownership and control between shareholders (principals) and managers (agents). It postulates that corporate executives may likely maximise their self-interests at the shareholders' expense, which imposes a duty on the board to exercise oversight and nip it in the bud. Generally, studies on the effect of agency theory on corporate governance typically examine how a company's leadership structure and board composition affect its performance [30].

This is so because board members must possess specific specialised attributes to perform their vital responsibilities efficiently. These characteristics include the board's size, expertise, and independence [80]. Independent directors are crucial in keeping an eye on managerial decisions to avoid overusing resources. To guarantee efficient oversight, though, having more than independent directors on the board might be required. Wang et al. [85] have therefore suggested the inclusion of independent directors with business expertise to enhance the monitoring function in their "expertise monitor" hypothesis. Furthermore, studies such as Badu and Appiah [17] report that smaller boards benefit company performance more by encouraging improved director coordination and communication. On the other hand, larger boards could make it harder to coordinate and communicate, which would hurt the company's performance. In a study conducted by Sarpong-Danquah et al. [75], for instance, they discovered that board size can compromise the financial performance of microfinance institutions.

Nevertheless, some authors argue that smaller boards limit diversity (2020), suggesting conflicting findings about how board size and independence affect firm performance. Goel et al. [43] deploy the quantile regression approach to predict the financial performance (Tobin's Q) of 213 Indian companies listed on the S&P Bombay Stock Exchange and find a significant positive link between board size and firm performance but a negative association between the appointment of independent directors and the firm performance. However, a thorough analysis of the literature by Agarwal [7] shows that board size, director independence, and board members with advanced degrees significantly improve firm performance while reducing agency costs. Furthermore, there is consensus in the literature that larger boards can accommodate more diversity, and outside directors can exercise effective oversight from the standpoint of agency theory [90].

Similarly, resource dependence theory recognises that firms operate as a product of their environment in an open market ecosystem. According to Pfeffer and Salanick [72], the board links a company and the variables that cause external dependencies and uncertainties. These uncertainties can hinder the company's daily

operations, limit its ability to manage resources, and ultimately hamper its strategic decisions [31]. To thrive and grow, the firm needs to handle these uncertainties well. Thus, board directors are uniquely positioned to offer organisational resources, such as know-how, credibility, and access to essential stakeholders [69, 71]. Thus, companies can reduce these uncertainties by employing directors who help the organisation engage with the outside world. To this end, Dalton et al. [30] document that the availability of valuable resources and information, a reduction in environmental dependence, or assistance in establishing legitimacy determine how much directors benefit the firm. Nguyen et al. [70] also claim that outside directors serve on various boards and that their performance influences their internal roles. They will be incentivised to perform better to maintain their position because poor performance will likely result in their dismissal, which could ruin their reputation. Hence, highly qualified individuals are more likely to be included on a board based on their past performance [70], thus enriching the company's decision-making processes through the various networks and resources they bring. For this reason, some scholars [18, 44] integrate agency and resource dependence theories to support their studies on the relationship between board expertise diversity and firm performance.

We explain why listed firms in sub-Saharan Africa could benefit from adopting good corporate governance practices by introducing convergence theory, following Boadi and Osarfo [19] from the developing country perspective. If developing nations adopt the best practices of developed nations, [11] argues, they can quickly catch up with them [83]. They contend that "developing countries should benefit from higher rates of productivity and, in some cases, may eventually overtake developed countries". Thus, the research looks at how the performance of the chosen companies might be affected by their adoption of developed-country best practices, which mandates the inclusion of a wide variety of expertise on corporate boards.

Board expertise diversity and firms' performance

The relationship between board expertise diversity and firm performance has been the subject of numerous academic studies with varying degrees of success. These studies do not consistently demonstrate a correlation, even though some report positive effects whilst others do not. Specifically, Wu et al. [88] examined 13,228 firm-year observations of data from the Taiwan stock market from 2006 to 2018. They found that having academic directors on corporate boards significantly increases capital expenditure and R&D costs, positively affecting firm performance. They also discovered that academic directors with backgrounds in technology and finance have positive relationships with ROA and Tobin's Q.

Similarly, Ettredge et al. [36] investigate three types of financial expertise: accounting-based, user-based, and supervisory-based professional experience, and report that board members with accounting-based experience help reduce information asymmetry in IPOs, resulting in lower under-pricing of initial offerings. In the same vein, a study conducted in China by Chen et al. [26], using 14,199 firm-year observations of US companies operating in China from 1996 to 2011, found that companies with board members with Chinese insights experienced higher returns on investment announcements. The market also responds positively when directors with Chinese knowledge are appointed. In a separate study in Japan, Sako and Kubo [73] found that professionals on corporate boards lead to increased stock return volatility, improved profitability, and higher Tobin's Q. Balogh's [18] study of ASX-listed companies also discovered that board members with expertise in finance, mining and engineering improve firm performance.

More research needs to be done in developing countries regarding how board expertise diversity influences firm performance. Nonetheless, in a study on 17 listed companies in Nigeria, Aifuwa and Saidu [8] detected that professional expertise and educational attainment of corporate board directors enhance a company's market performance. However, their attempts to establish a clear connection between firm performance and educational diversity were unsuccessful. Another study by [1] demonstrates that professionals in accounting and finance serving on audit committees improve Ghanaian-listed companies' corporate disclosure practices. Boadi and Osarfo [19] also point out that when Ghanaian banks adopt sound corporate governance practices, higher education among board members improves bank performance.

Some studies have found negative or insignificant results regarding the relationship between board expertise diversity and firm performance. For example, Meng and Tian [65] examined the link between board expertise and executive incentives, and they observed that although board expertise leads to better investment decisions, it negatively impacts the value of mature companies. Ettredge et al. [36] also found that certain types of financial knowledge do not improve IPO outcomes. Outside Africa, research by Gray and Nowland [44] identified board size, industry, and company location as critical determinants of board expertise diversity. Their findings indicate that while diversifying expertise within a subset of specialised industries can be advantageous to shareholders, going beyond that subset may result in a degradation of firm value.

They also discovered no significant connection between firm performance and the total diversity of expertise on Australian corporate boards. Therefore, we formulate the hypothesis as follows:

H1 Professional expertise diversity on corporate boards significantly improves the financial performance of publicly traded companies.

The moderating role of firm size on the link between board expertise diversity and firms' financial performance

The empirical analysis shows that previous studies on the relationship between board expertise diversity and firm performance do not consider intervening variables. However, Kagzi and Guha [52] claim that contextual factors may have an influence. In this regard, Child [27] states that from the contingency theory perspective, one such contextual factor could be the firm size. Moreover, some studies have found that firm size is one of the most critical factors influencing firm operations, including information processing and group decision-making [60]. Additionally, larger businesses can formalise their processes and take advantage of economies of scale and scope, improving performance and making their operations more efficient. Furthermore, a diverse board can be a vital business strategy for companies seeking success [40, 60] and aid organisations in attracting and keeping qualified directors.

An alternative perspective casts doubt on the positive connection between firm size and market power and asserts that firm size can result in inefficiencies and relatively poor performance. This is so because, according to Fani Fadilah et al. [39], hierarchies are more prevalent in larger firms, potentially resulting in a more extensive allocation of power and undermining the influence of board expertise diversity on overall firm performance. Furthermore, inertia pressures, which are more pronounced in larger companies, may limit the effectiveness of board expertise diversity in decision-making. For instance, Arnegger et al. [15] assert that larger companies are more susceptible to bureaucracy and core rigidity, which can limit their board members' creative potential. On the contrary, Li and Chen [60] report that smaller businesses are more likely to take on and put into practice innovative ideas from various angles and are more adept at deciding on new projects quickly. They demonstrate that the positive effects of board gender diversity on firm performance are undermined by firm size. In a nutshell, diversity offers many perspectives, which can benefit a smaller company with deep and varied expertise. Therefore, we hypothesise as follows:

H2 Firm size moderates the bond between the diversity of expertise on corporate boards and firm performance.

Impact of firm age on the link between the diversity of expertise on corporate boards and firm performance

There is little empirical study regarding the impact of firm age on the link between board expertise diversity and firm performance. This relationship is contingent upon many factors, such as the company's size, market, and lifecycle [57, 63]. According to [32], age is a firm-specific characteristic that influences its experience, resources, stakeholder relationships, reputation, strategic position, and market share. Furthermore, firm age has been seen as a variable significantly affecting organisational outcomes in earlier research [25, 63]. Some studies assert that firm performance improves with age, as manifested in a survey of Spanish manufacturing firms [28]. However, other strands of literature claim that, as a firm gets older, organisational rigidities become more entrenched, which lowers profitability. Additionally, the assets of older firms become less functional; their rent-seeking behaviour becomes more ingrained, their sales slack, and their investment levels drop. Some studies report that older companies perform better in specific industries than younger ones despite empirical data suggesting that a firm's financial performance declines with age. For example, in an Italian study, Capasso [25] reports that older wineries produce higher performance than younger ones due to longevity. Therefore, we hypothesise as follows:

H3 Firm age moderates the link between the diversity of expertise on corporate boards and firm performance.

Based on the empirical evaluation and research hypothesis, we propose the following conceptual framework to illustrate the relationships between the key variables of our study (Fig. 1).

Methodology

Sample, data sources, and justification

Our paper examines 279 publicly traded companies from three sub-Saharan African countries: 38 from the Ghana Stock Exchange, 177 from the Nigerian Stock Exchange, and 64 from the Nairobi Stock Exchange in 2018. We use these exchanges because they are very active and have much information about them [16, 20, 67]. Furthermore, they have uniform or similar corporate governance codes based on the Anglo-Saxon framework, which recommends that board appointments should emphasise individual board members' skills, qualifications, experience, and expertise, with an additional requirement to declare the qualifications and experience of the directors who sit

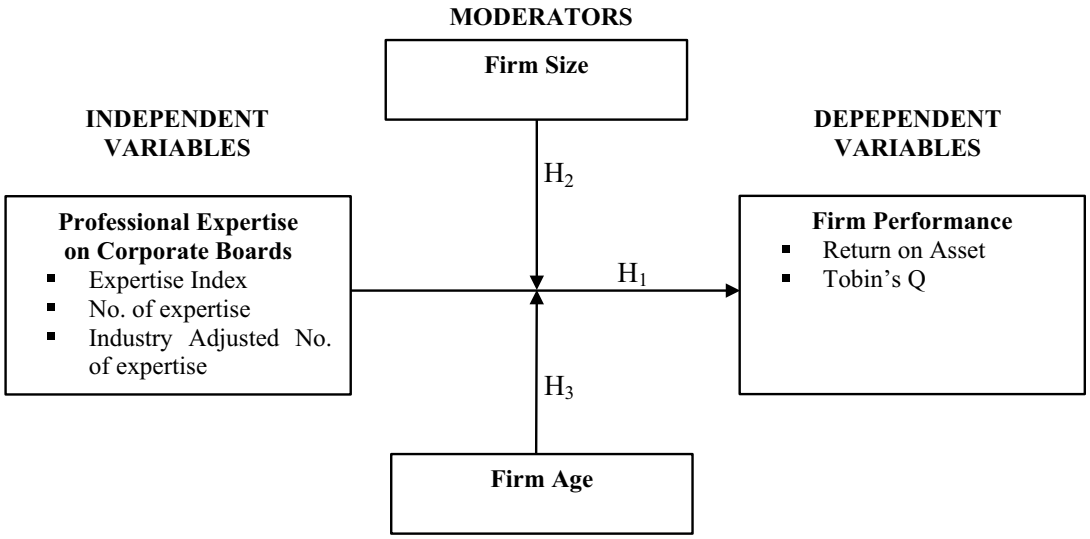

Fig. 1 Conceptual framework showing the moderating role of firm size and age on the link between board expertise diversity and firm performance

on their boards in their annual reports. This means that examining the demographic profile of board members must reveal the expertise characteristics envisioned by the Act.

The study uses AfricanFinancials (www.africanfinancials.com), which offers a one-stop platform for rich financial data on listed firms in Africa, in the light of the paucity and dispersion of financial data on listed companies in developing nations. The website provides thorough annual financial reports for listed companies in about ten African countries, broken down by industry. To obtain demographic information about board members, we extracted it from the firms' annual reports using Gray and Nowland's [44] methods for data collection and professional expertise classification. We carried out additional web searches to supplement the board data from the annual reports and close any gaps. If a director possesses multiple areas of expertise, we consider their primary area and classify any subsequent additional or supplementary expertise as secondary. We then match each director's professional experience with the industry type and location to see how they converged in a particular industry and location.

We implemented specific filtering criteria to arrive at a sample of 128 non-financial companies listed in the three sub-Saharan African countries. Initially, we included companies listed on the chosen exchanges for at least five years to account for the endogenous effects of the firms' age and size and those with publicly accessible annual reports. We ruled out financial institutions due to their stringent board composition requirements. South Africa was excluded because it is considerably more developed than the other exchanges. Zimbabwe was left out due to its distinct economic conditions, including severe hyperinflation and subpar financial performance. We also omitted Francophone countries like Côte d'Ivoire and Togo to avoid potential errors during translation from French to English. Using this approach, we obtained a sample of 128 non-financial firms, leading to 1128 firm-level observations distributed among Kenya (28), Nigeria (88), and Ghana (17). We also sourced macroeconomic data from the World Bank's official website.

Outcome variables: firm performance

To investigate the factors that influence board expertise diversity and firm performance, we use Tobin's Q, a market–based performance indicator, as our primary outcome variable. Previous studies [18, 44, 73] used Tobin's Q. We also follow Gray and Nowland [44] to use ROA as an auxiliary variable to measure the firm's financial performance. ROA is a good indicator of financial performance because it examines how assets contribute to managerial effectiveness [76, 79]. As a result, the higher a company's ROA, the greater its profits from its capital investments.

Independent variables

Our study relies on expertise diversity as our core explanatory variable. Following the works of Balogh [18] and Gray and Nowland [44], we proxy expertise diversity with three independent variables: expertise index, industry-adjusted number of experts, and the number of experts on the boards. We also interact firm age and size with expertise diversity to answer our second question of the

moderating role of firm size and firm age on the professional expertise diversity—firm performance nexus. We use the natural log of total assets to proxy firm size.

Control variables

To consider the possibility of omitted variables, we introduce different control variables related to the board, firm, and country of origin of the publicly traded companies, as follows:

Board size

We define board size as the total number of directors on the boards of listed companies. Previous studies [22, 54] show a value-enhancing link between board size and firm performance. The authors argue that from the perspective of resource dependence and agency theories, larger boards can accommodate a wide array of expertise and independent directors, bringing critical value-adding resources to the organisation and improving their decision-making.

CEO duality

The extent to which the CEO exerts influence on boards and, to a considerable extent, the board's independence depends on whether the position of the CEO is split between the board chair and the company manager. CEO duality runs contrary to agency theory. This frequently gives the CEO more sway, which may impact the board's independence and effectiveness [2, 52]. We, therefore, expect CEO duality to hurt the firm's financial performance.

Independent directors

We use the number of directors who do not have any direct link to the company as a measure of board independence. From the perspective of resource dependence and agency theories, corporate boards with a high percentage of independent members can improve the provisioning and oversight of resources [15, 60]. We, therefore, expect independent board directors to have a significant favourable influence on the firm's financial performance.

Board gender diversity

The proportion of women on boards generally benefits business performance [82] because of their efficiency and agility [3]. Therefore, gender-diverse boards are anticipated to enhance company performance. We controlled for gender diversity and used the percentage of female directors on the board as a proxy for gender diversity. We expected a positive link between board gender diversity and firm performance.

Multiple directorships

From the resource dependence theory perspective, directors who hold positions on the boards of other companies provide critical linkages and interlocks (Saneesh [74, 91]) that can enrich decision-making and improve firm performance. We, therefore, control for such multiple directorships, which we measure as the proportion of board directors who sit on the boards of other companies.

Firm-level controls

Moreover, in line with the scope of operations hypothesis, which establishes a direct link between firm size and board composition, this study uses firm size as a variable to control for economies of scope and scale. Firm size is essential because of its risk-neutral effect on corporate ownership [82]. Large firms generally enjoy economies of scale and scope, which enhances firm performance [21]. We use the natural logarithm of total assets, return on assets, growth, and debt to firms' total assets as firm-level control variables to account for this.

Country level variables

We introduce gross domestic product, which measures a country's economic development as a control variable. Given that this study focused on three sub-Saharan African countries, it is imperative to consider the different economic development variables that may impinge on firm performance. A booming economy may bode well for business and bring about a significant impact on firm performance. Therefore, this study follows [75] to control for gross domestic product per capita and the ratio of market capitalisation to GDP.

Models for empirical estimation

The present study uses Newey–West heteroscedastic tests to explain the connection between board expertise diversity and firm performance. This is justifiable because the diagnostic tests show heteroscedasticity, and the data are not normally distributed. In addition, the Newey–West heteroscedastic coefficient tests are robust against autocorrelation and heteroscedasticity [14, 68, 86].

As such, we follow Gray and Nowland [44] to specify the following four regression models:

$$\text{Tobin}^{'}\text{s Q} = \alpha + \text{Expertise diversity}_{\text{i}} + \sum \text{Firm}_{\text{i}} + \sum \text{Board}_{\text{i}} + \sum \text{Industry}_{i} + \text{GDP}_{i} + \text{MKT CAP}_{\text{i}} + \varepsilon_{\text{i}} \quad (1a)$$

$$\text{ROA} = \alpha + \text{Expertise diversity}_{\text{i}} + \sum \text{Firm}_{\text{i}} + \sum \text{Board}_{\text{i}} + \sum \text{Industry}_{i} + \text{GDP}_{i} + \text{MKT CAP}_{\text{i}} + \varepsilon_{\text{i}} \quad (1b)$$

$$\text{Tobin}^{'}\text{s Q} = \alpha + \text{Expertise diversity}_{i} * \text{firm age} + \sum \text{Firm}_{i} + \sum \text{Board}_{i} + \sum \text{Industry}_{i} + \text{GDP}_{i} + \text{MKT CAP}_{i} + \varepsilon_{i} \quad (2a)$$

$$\text{ROA} = \alpha + \text{Expertise diversity}_{i} * \text{firm age} + \sum \text{Firm}_{i} + \sum \text{Board}_{i} + \sum \text{Industry}_{i} + \text{GDP}_{i} + \text{MKT CAP}_{i} + \varepsilon_{i} \quad (2b)$$

$$\text{Tobin}^{'}\text{sQ} = \alpha + \text{Expertise diversity}_{i} * \text{firm size} + \sum \text{Firm}_{i} + \sum \text{Board}_{i} + \sum \text{Industry}_{i} + \text{GDP}_{i} + \text{MKT CAP}_{i} + \varepsilon_{i} \quad (3a)$$

$$\text{ROA} = \alpha + \text{Expertise diversity}_{i} * \text{firm size} + \sum \text{Firm}_{i} + \sum \text{Board}_{i} + \sum \text{Industry}_{i} + \text{GDP}_{i} + \text{MKT CAP}_{i} + \varepsilon_{i} \quad (3b)$$

where:

- The subscript i represents the cross-sectional dimension of the data.
- α denotes a constant in the regression model
- The diversity of expertise$_i$ denotes the number of types of expertise or the expertise index or the industry-adjusted number of types of expertise for the company i.
- Firm$_i$ denotes a set of firm-level variables, including the natural logarithm of total assets, return on asset, growth, leverage, asset growth, and debt to total assets.
- Board$_i$ denotes a set of board-level variables, including board size, percentage of independent directors, gender, and multiple directorships.
- Industry$_i$ represents a set of industry sector dummy variables
- GDP$_i$ means the Gross Domestic Per Capita of a country i
- MKT CAP$_i$ represents the ratio of the market capitalisation of country i
- Firm age denotes the number of years of Firm$_i$

Table 1 presents thorough definitions of variables and notations used in the econometric models of the study.

Results and discussions

Table 2 presents the descriptive statistics of the board composition. We observe in Table 2 that the average board size of the companies is 9.18, with a minimum of 4 and a maximum of 15 board members. This implies that, on average, the board is approximately composed of nine members. Females comprise about 20% of board members, with independent directors accounting for about 27% of board members. Directors with additional directorships in other companies account for approximately 63 per cent of the total. The average number of types of professional expertise on boards was 5.97, with an average expertise index of 0.95, indicating that the diversity of professional expertise is intense on the board. These findings are generally consistent with those of [18, 44].

Table 3 shows that the mean score for firm age is 45.14 years, implying that the sampled firms have been operating on average for more than 45 years. The average score for total assets is $4,868,725,450, with a ROA of 0.033, implying that the firms averagely generate 3.3 returns on their assets. Also, we show that, on average, the firm records a Tobin's Q of 1.68, implying that the market favourably views the firms in a good light. Furthermore, the average asset growth score is 2.8 per cent, and the debt-to-asset ratio is 0.62, indicating that the firms use approximately 62 per cent of their debt to finance their assets. The average leverage is also 1.64, with a market capitalisation of $63,723,933,208.32. Finally, the average GDP per capita score was $2,140.51, indicating that each citizen in the selected countries has an average of $2,140.51 in GDP equity.

Descriptive statistics of professional expertise on corporate boards

Figure 2 displays a descriptive analysis of the variety of expertise on the boards. It shows that accountants $n=215$;19.1%), executives ($n=209$, 18.5%), lawyers ($n=140$,12.4 per cent), consultants ($n=130$, 11.5%), and engineers ($n=129$;11.4 per cent) are common on the corporate boards. However, public servants and medical doctors ($n=15$, 1.3%, respectively; scientists, $n=31$, 2.8%; politicians, $n=14$, 1.2%; and pharmacists, $n=13$; 1.1%) held relatively fewer board positions. This is consistent with the findings of Gray and Nowland [44], who discovered a predominance of accountants, lawyers, executives, consultants, and bankers on the boards of Australian companies.

Correlation analysis

Table 4 shows the Pearson correlation matrix of the numeric variables used in the study. The results indicate a positive and significant correlation between board size and the number of professional experts. The results also show a positive and significant correlation between the number of types of expertise and ROA and leverage. Hair et al. [45] assert that multicollinearity is problematic only when there is more than 80% correlation between any two independent variables. As none of the independent variables exceeded the 80% criterion, multicollinearity was not an issue. Unreported results for the variable inflation factors also revealed no multicollinearity in the data.

Table 1 Variables, notation, and measurement

Variable	Notation	Measurement
Dependent variable		
Firm performance		
Tobin's Q	TBQ	Market value of equity plus book value of debt, all divided by total assets
ROA	ROA	Return on assets (winsorised at 1st and 99th percentile)
Independent variables		
Expertise diversity		
No. of expertise	NXP	Number of different types of expertise on the boards
Expertise index	EXPIND	Herfindahl index of squared proportions of each type of professional expertise
Industry-adjusted no. of expertise	INADJ	The number of different types of professional expertise on the board divided by the industry average number of expertise
Business expertise	BEXP	A vector of business-related expertise
Other expertise	OEXP	A vector of the remaining expertise, excluding the business expertise
Moderating variables		
Firm age	FAGE	Total number of years the firm has been in existence
Firm size	TAST	Natural logarithm of total assets
Control variables		
Board level		
Board size	BSIZE	The total number of directors on the board
% independent	INDCE	% of independent directors on the board
% females	BGD	% of female directors on the board
% multiple directorships	MDIR	% of directors holding positions on more than one boards
CEO duality	CDUAL	Binary = 1 if the same person performs both the Chairman of the board and CEO roles; = 0 otherwise
Firm-level		
Ln (Total assets)	TAST	Natural logarithm of total assets
Leverage	LEV	Earnings before interest and taxes divided by interest expense of long-term debt
Return on assets	ROA	Return on assets (winsorised at 1st and 99th percentile)
Debt to asset	DBTAST	Total debt divided by total assets (winsorised at 1st and 99th percentile)
Asset growth	ASGTH	One year growth in total assets (winsorised at 1st and 99th percentile) for 2017 -18
Country level		
Gross domestic product	GDP	Natural logarithm of gross domestic product per capita
Market capitalisation	MKCAP	The market capitalisation of the firm in USD
Industry level		
Agric-industrial	AGRIND	Based on the classification of African Financials as Agric-Industrial
Agricultural	AGRIC	Based on the classification of African Financials as Agricultural
Beverages	BEV	Based on the classification of African Financials as Beverages
Communications	COMM	Based on the classification of African Financials as Communications
Chemicals	CHEM	Based on the classification of African Financials as Chemicals
Energy	ENGY	Based on the classification of African Financials as Energy
Engineering	ENGR	Based on the classification of African Financials as Engineering
Food	FD	Based on the classification of African Financials as Food
Health	HLTH	Based on the classification of African Financials as Health
Industrial holding	INDHD	Based on the classification of African Financials as Industrial Holding
Investment	INVST	Based on the classification of African Financials as Investment
Mining	MNG	Based on the African Financials as Mining
Paper & packaging	PAPG	Based on the classification of African Financials as Paper & Packaging
Pharmaceuticals	PHARM	Based on the classification of African Financials as Pharmaceuticals
Transport	TT	Based on the classification of African Financials as Transport
Printing & publishing	PRTPUB	Based on the classification of African Financials as Printing & Publishing
Property	PTY	Based on the classification of African Financials as Property
Retail	RET	Based on the classification of African Financials as Retail

Table 1 (continued)

Variable	Notation	Measurement
Support services	SUPSS	Based on the classification of African Financials as Support Services
Technology	TECH	Based on the classification of African Financials as Technology
Tourism	TRSM	Based on the classification of African Financials as Tourism

Table 2 Descriptive statistics of board composition

Variables	Observation	Mean	Median	Std. deviation	Min	Max
BSIZE	1128	9.18	9.00	2.635	4.00	15.00
NXP	1128	5.97	6.00	1.56	3.00	10.00
EXPIND	1128	0.95	0.97	0.05	0.75	1.00
INDADJ	1128	0.46	0.41	0.28	0.02	1.34
% BGD	1128	0.20	0.18	0.15	0.00	1.00
% MDIR	1128	0.63	0.62	0.23	0.00	1.00
% INDCE	1128	0.27	0.25	0.14	0.00	0.75

Source: Author's Construction

Table 3 Descriptive statistics of firm characteristics. Source: analysis of sample data

Variables	Mean	Median	Standard deviation	Skewness
FAGE	45.14	42.50	23.52	0.814
TAST	$4,868,725,450	105,733,674.5	31,678,864,938	10.24
ROA	0.033	0.030	0.10698663	−0.21
TBQ	1.68	0.95	3.44	9.92
ASGTH	0.02844858	0.18	0.21139412	0.030
DBAST	0.62	0.52	0.75260602	6.56
LEV	1.641	0.9069	4.30	12.14
GDP	2140.51	2,229.86	166.50	−1.43
MKCAP	63,723,933,208.32	85,520,000,000	31,584,085,047.77	−0.78

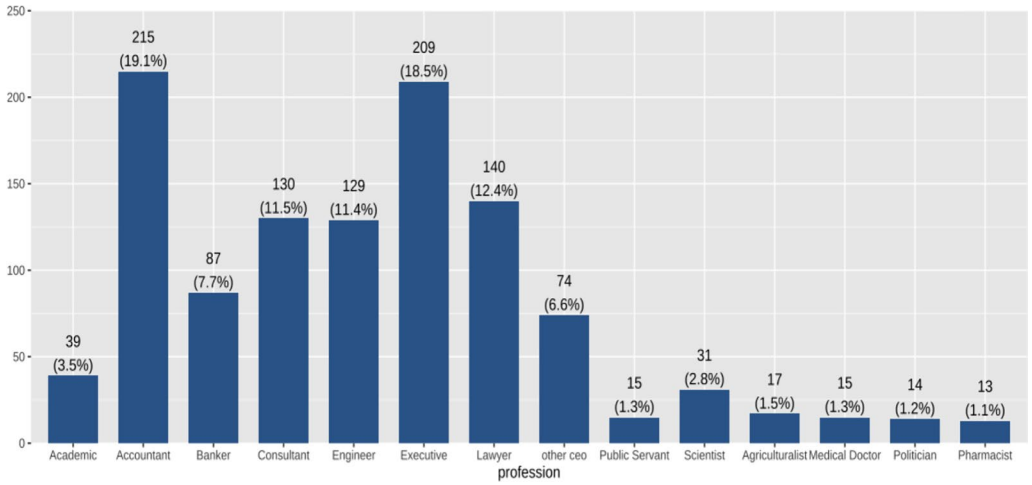

Fig. 2 Bar Chart of Professional Expertise on Corporate Boards

Table 4 Correlation coefficients between explanatory variables

		1	2	3	4	5	6	7	8	9	10	11
1	BSIZE											
2	NXP	.729***										
3	BGD	.056	.049									
4	MDIR	.041	−.047	.128***								
5	INDCE	.047	−.059*	.253***	.120***							
6	FAGE	−.005	.006	.295***	−.016	.308***						
7	TAST	−.061*	−.083**	.051	.067*	.095**	.074*					
8	ROA	.145***	.151***	−.035	.076*	.126***	.022	−.054				
9	ASGTH	.178***	.186***	−.176***	.013	.009	−.134***	−.105***	.373***			
10	DBTAST	−.057	−.015	−.028	.088**	−.012	−.061*	−.094**	−.167***	−.234***		
11	LEV	.211***	.201***	−.070*	.068*	−.092**	−.068*	−.056	.056	.086**	.091**	
12	GDP	.062*	.207***	−.224***	−.032	−.451***	−.396***	−.172***	−.068*	.150***	.167***	.125***

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

For correlation larger than |0.10|, $p < 0.001$; for corr. greater than |0.08|, $p < 0.01$; for corr. larger than |0.06| $p < 0.05$

Results on the effect of diversity of professional expertise on corporate boards on firms' financial performance

Table 5 summarises the model's findings regarding the relationship between board expertise diversity and firm performance. Models 1–3 depict the relationship between the number of expertise (1), expertise index (2), industry-adjusted number of expertise (3), and Tobin's Q. Consistent with the findings of Gray and Nowland [44], we find no significant cross-sectional link between all proxies of expertise diversity and Tobin's Q. A neutral Tobin's Q can imply that the market does not see long-term growth prospects or competitive advantages the firms can gain in the future given that it measures the market's value of a company's assets with their replacement cost [23, 51]. Additionally, because the study comprehensively focused on all the non-financial industries on the three exchanges, the market's expectations for a given sector and the industry's overall growth prospects may have an impact on a neutral Tobin's Q. Our hypothesis of a significant positive link between professional expertise diversity and company value is consequently refuted by this evidence.

Models 4–6 present the relationship between board expertise diversity and firm performance using ROA as a proxy. Except for the expertise index, the coefficients for the number of experts and industry-adjusted number of experts are all positive at the 1% significance level. This endorses a line of studies [73] finding a positive link between the diversity of expertise on corporate boards and firm performance. It also upholds our prediction of a significant positive influence of board expertise diversity on the firm's financial performance based on the integration of agency, resource dependence, and convergence theories. Against the backdrop that ROA focuses on the firm's ability to generate profits on its assets in the short run, the discovery of a significant positive effect of board expertise diversity on ROA indicates that the listed firms utilised their assets efficiently to generate profits in 2018.

Following Gray and Nowland [44], we pick vital business expertise as our primary explanatory variable in Models 7–8 to investigate how it influences the firm's financial success. Our findings support a slew of studies [56, 58] that show how vital business experience can improve the financial successes of firms by revealing a positive correlation between the number of expertise diversity and ROA at significant values of 5 and 10%, respectively.

The findings of the firm-level control variables show that the coefficients for total assets are positive and significant across all the columns at the 5% significance level for firm value and at the 1% significance level for the firm's financial performance. Similarly, the asset growth coefficients are positive at the 1% significance level for Tobin's Q and ROA. At the 1% significance level, we also find evidence of a positive and significant link between debt-to-asset ratio and firm value but a negative and significant link between debt-to-asset ratio and the firm's financial performance. We also observe a significant but negative association between leverage and firm value, indicating that the market is averse to the high incidence of debt in the firm's books. On the contrary, we find a positive and significant relationship between the firm's leverage and ROA at the 1% significance level, highlighting the prudent manner in which the firm's management uses borrowed funds.

Except for column 5, all board size coefficients are negative and significant at either the 1% or 5% significance level, demonstrating that board size negatively affects the

Table 5 Regression results of the link between diversity of professional expertise and firm performance

	TOBIN'S Q				RETURN ON ASSETS			
	1	2	3	4	5	6	7	8
NEXP	0.029			0.007***			0.007*	
	(0.112)			(0.002)			(0.004)	
EXPIND		3.000			0.010			
		(2.300)			(0.041)			
INADJ			−0.432			0.058***		0.076**
			(1.035)			(0.018)		(0.036)
TAST	0.258**	0.263**	0.246*	0.010***	0.009***	0.010***	0.025***	0.026***
	(0.127)	(0.126)	(0.128)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
ROA	0.137	0.17	0.255					
	(1.706)	(1.694)	(1.703)					
ASTGTH	3.255***	3.239***	3.288***	0.119***	0.123***	0.119***	0.148***	0.147***
	(0.772)	(0.771)	(0.773)	(0.013)	(0.013)	(0.013)	(0.019)	(0.019)
DBTAST	0.961***	0.998***	0.971***	0.051***	−0.051***	−0.051***	−0.008*	−0.009*
	(0.329)	(0.330)	(0.330)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
LEV	−0.309***	−0.308***	−0.308***	0.004***	0.004***	0.004***	0.002*	0.002*
	(0.057)	(0.057)	(0.057)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MKCAP	0.000***	0.000***	0.000***	0.000	0.000	0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP	0.004***	0.004***	0.004***	0.00003*	0.00005***	0.00004**	0.0001***	0.0001***
	(0.001)	(0.001)	(0.001)	(0.00002)	(0.00002)	(0.00002)	(0.00003)	(0.00003)
BSIZE	−0.180***	−0.189***	−0.151**	−0.003**	0.0002	−0.002*	−0.008***	−0.008***
	(0.067)	(0.051)	(0.063)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
INDCE	−0.775	−0.735	−0.818	0.083***	0.079***	0.081***	0.047	0.047
	(0.871)	(0.869)	(0.870)	(0.015)	(0.015)	(0.015)	(0.029)	(0.029)
BGD	−0.252	−0.303	−0.261	−0.008	−0.007	−0.004	−0.002	0.002
	(0.720)	(0.720)	(0.720)	(0.013)	(0.013)	(0.013)	(0.025)	(0.025)
MDIR	−1.139**	−1.138**	−1.169**	0.011	0.008	0.01	0.024	0.025
	(0.476)	(0.473)	(0.475)	(0.008)	(0.008)	(0.008)	(0.017)	(0.017)
CDUAL	0.855	0.858	0.85	0.002	0.002	0.002	−0.008	−0.008
	(0.571)	(0.571)	(0.571)	(0.01)	(0.01)	(0.01)	(0.021)	(0.021)
AGRIC	0.975	1.007	1.134	0.129***	0.136***	0.116***	0.156***	0.135***
	(0.901)	(0.897)	(0.958)	(0.015)	(0.015)	(0.017)	(0.030)	(0.033)
BEV	1.314	1.339	1.486	0.053***	0.063***	0.045***	0.065**	0.049
	(0.899)	(0.886)	(0.942)	(0.016)	(0.016)	(0.017)	(0.031)	(0.033)
BDAST	0.813	0.814	1.087	0.093***	0.100***	0.065***	0.085***	0.045
	(0.861)	(0.856)	(1.047)	(0.015)	(0.015)	(0.018)	(0.029)	(0.036)
CHEM	2.815	2.847*	2.907*	−0.059*	−0.057*	−0.067**	−0.136**	−0.148***
	(1.715)	(1.714)	(1.725)	(0.030)	(0.031)	(0.031)	(0.053)	(0.053)
COMM	0.702	0.729	0.668	−0.015	−0.012	−0.006	0.020	0.030
	(1.219)	(1.218)	(1.223)	(0.022)	(0.022)	(0.022)	(0.045)	(0.045)
ENGY	1.138	1.139	1.517	0.077***	0.080***	0.029	0.086***	0.023
	(0.830)	(0.829)	(1.213)	(0.015)	(0.015)	(0.022)	(0.028)	(0.042)
ENG	1.477	1.481	1.580*	0.025	0.026	0.012	−0.017	−0.035
	(0.926)	(0.925)	(0.956)	(0.016)	(0.016)	(0.017)	(0.032)	(0.033)
FD	3.028***	3.040***	3.352***	0.079***	0.086***	0.045**	0.082***	0.034
	(0.845)	(0.839)	(1.103)	(0.015)	(0.015)	(0.020)	(0.029)	(0.039)
HLTH	−0.844	−0.864	−0.74	0.026	0.034*	0.023	0.011	0.003
	(1.074)	(1.069)	(1.084)	(0.019)	(0.019)	(0.019)	(0.043)	(0.043)

Table 5 (continued)

	TOBIN'S Q				RETURN ON ASSETS			
	1	2	3	4	5	6	7	8
INDHD	0.604	0.642	0.871	0.039**	0.044***	0.01	0.025	−0.015
	(0.875)	(0.872)	(1.057)	(0.015)	(0.016)	(0.019)	(0.030)	(0.037)
INVST	0.426	0.586	0.347	0.062**	0.043*	0.042*	0.048	0.030
	(1.385)	(1.362)	(1.351)	(0.024)	(0.024)	(0.024)	(0.045)	(0.044)
MNG	1.304	1.316	1.361	−0.002	−0.005	−0.015	−0.023	−0.04
	(1.022)	(1.020)	(1.035)	(0.018)	(0.018)	(0.018)	(0.035)	(0.036)
PAPK	0.785	0.811	0.819	0.02	0.026	0.024	0.066	0.067
	(1.537)	(1.534)	(1.535)	(0.027)	(0.027)	(0.027)	(0.050)	(0.050)
PHARM	0.274	0.289	0.417	0.056***	0.066***	0.052***	0.060*	0.048
	(0.935)	(0.923)	(0.958)	(0.016)	(0.016)	(0.017)	(0.034)	(0.034)
PRTPUB	−0.1	−0.132	−0.006	0.092***	0.089***	0.074***	0.106***	0.084**
	(0.929)	(0.927)	(0.962)	(0.016)	(0.016)	(0.017)	(0.031)	(0.033)
PTY	−0.858	−0.899	−0.712	−0.001	0.007	−0.009	−0.092**	−0.105***
	(1.168)	(1.163)	(1.195)	(0.021)	(0.021)	(0.021)	(0.038)	(0.039)
RET	0.699	0.65	0.839	0.096***	0.105***	0.090***	0.068**	0.055
	(0.976)	(0.970)	(1.003)	(0.017)	(0.017)	(0.018)	(0.032)	(0.034)
SUPSS	−1.619	−1.609	−1.54	0.055**	0.056**	0.044*	0.025	0.011
	(1.271)	(1.270)	(1.285)	(0.022)	(0.023)	(0.023)	(0.044)	(0.044)
TECH	2.658***	2.640***	2.827***	0.105***	0.107***	0.083***	0.104***	0.074**
	(0.888)	(0.888)	(0.975)	(0.015)	(0.016)	(0.017)	(0.030)	(0.034)
TRSM	−0.072	−0.057	−0.001	0.072***	0.072***	0.062***	0.066**	0.052
	(0.949)	(0.948)	(0.964)	(0.017)	(0.017)	(0.017)	(0.032)	(0.033)
TT	−0.053	−0.046	0.084	0.087***	0.091***	0.073***	0.100***	0.079**
	(0.906)	(0.904)	(0.955)	(0.016)	(0.016)	(0.017)	(0.031)	(0.033)
Obs	1128	1128	1128	1128	1128	1128	646	646
R^2	0.14	0.14	0.14	0.44	0.43	0.44	0.41	0.41
Adj. R^2	0.11	0.11	0.11	0.43	0.42	0.42	0.38	0.38
Constant	6.887***	4.556	6.637***	0.221***	−0.237***	−0.197***	−0.091	−0.059
	(2.289)	(2.891)	(2.352)	(0.040)	(0.051)	(0.041)	(0.078)	(0.079)

Significance Levels: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. The standard errors are provided in parentheses

firm's financial performance. This may be due to issues with larger boards, which can render their monitoring and resource provisioning functions ineffective [75] and increase agency issues in businesses [35, 48].

Similarly, we show that independent directors on the board have a positive and significant impact on the firm's ROA, as evidenced by the positive coefficients at the 1% threshold for columns 4–6. This highlights the significance of director independence as a predictor of firm performance. These findings are consistent with the agency theory, which holds that independent directors can limit managerial opportunism. In contrast to the resource dependence theory, which asserts that external directors bring legitimacy and critical resources to the board through their social networks, we find that directors who serve on additional boards negatively and significantly influence firm value at the 5% significance level. It appears that the busyness of corporate directors (Saneesh [74]) and the spread of concentration across numerous companies may limit their maximum decision-making contribution. Furthermore, despite accounting for 20% of board members, females have a negative but insignificant impact on firm performance in all the proxies of board expertise diversity except column 8.

Regarding how industry affects firm performance, the results demonstrate that, when all other variables are held constant, on average, ROA is predicted to be higher if the firm is in the agricultural, beverage, building and associated, energy, food, industrial holding, pharmaceuticals, printing and publishing, retail, support services, technology, tourism, and transportation industries other than the agro-industrial sector and lower for businesses in the chemicals industries. Given that agriculturalists, pharmacists, and engineers are on the boards and the

countries are agrarian, it is not farfetched to assume that their presence positively influences the nous and decision-making processes on the boards.

The moderating impact of firm age and size on the diversity of expertise – firm performance *nexus*.

In the light of our findings of a robust positive link between board expertise diversity and the firm's financial performance but no cross-sectional relationship between firm value, we expand our research to look at how firm age and size affect the relationship. As a result, we interact firm age and size with each measure of expertise diversity, and the results are shown in Table 6. Models 1–2 provide results of the interaction effect of firm size on the link between board expertise diversity and Tobin's Q, whilst models 3–4 analyse the impact of firm age on the relationship. Similarly, models 5–6 explore the interaction effect of firm size on the relationship between board expertise diversity and ROA, whereas models 7–8 report the impact of firm age on the nexus. We find that firm size undermines the relationship between firm value and industry-adjusted number of expertise at a 1% significance level. One likely explanation is that growing businesses typically have more bureaucratic organisational structures, which impede quick decision-making. In addition, it becomes more challenging to manage and coordinate a larger workforce, which can cause problems with coordination and communication that have a detrimental effect on output. Bigger businesses could also grow more cautious and rigid, making it harder for them to take advantage of new opportunities and adjust to changes in the market. This result supports our hypothesis of a moderating effect of firm size on board expertise diversity, which also confirms the empirical findings of previous studies [24, 33, 60].

Although insignificant, we also find that firm age harms the relationship between firm financial performance, the multitude of experts, and the industry-adjusted number of experts on the boards. Garcia-Ramos and Diaz [41] argue that the age of a company indicates its life cycle stage and organisational inertia, as suggested by Zona et al. [92]. This inertia increases the company's propensity to maintain the status quo. Considering that the average age of the companies is 45, it can be assumed that many face more inertia due to their age, which limits their ability to adopt diversity initiatives and make decisions that can improve their company performance.

Simple slopes analysis

The slope of industry-adjusted no. of expertise (SIADJ)	Estimate	Standard errors	*t*-values	*p*-values
TAST when SIADJ is 7.024636 (-SD)	0.40	0.75	0.54	0.59
TAST when SIADJ 8.093085 (Mean)	−1.09	0.72	−1.52	0.13
TAST when SIADJ 9.161534 (+1 SD):	−2.59	0.87	−2.99	0.001

Source Slope analysis of the effect of firm size on the industry-adjusted number of expertise–firm value nexus using the interaction package in R developed by

Figure 3 shows the simple regression lines representing how firm size influences the industry-adjusted number of expertise scores on Tobin's depicted at different levels: at the industry-adjusted number of expertise mean, one standard deviation higher than the mean, and one standard deviation lower than the mean. The simple regression for the mean and one standard deviation below the mean for the industry-adjusted number of experts does not show statistical significance. However, looking at one standard deviation above the mean for the industry-adjusted number of experts (9.161534 + S.D.), there is a noteworthy and significant reduction in firm value ($b = -2.59$, $p < 0.001$). This demonstrates that assuming all things are equal, a one per cent standard deviation increase in firm size reduces the firm value by 2.59, exemplifying the negative influence of firm size on firm value.

Conclusions

This study seeks to elucidate two pivotal inquiries: firstly, does a nexus exist between the diversity of expertise on corporate boards and the financial performance of firms? Secondly, are the dimensions of firm age and size influential moderators in the nexus between board expertise diversity and organisational financial outcomes? To dissect these questions, our analysis leverages a novel dataset encompassing 279 publicly listed entities across three select sub-Saharan African nations, from which a refined cohort of 128 non-financial firms, yielding 1128 firm-level data points, was meticulously extracted. Employing the Newey–West Heteroscedasticity test, our study probes the intricate interplays among the variables under scrutiny. Utilising return on assets and Tobin's Q as the

Table 6 Regression results of the moderating role of firm size and firm age in the relationship between board expertise diversity and firm performance

	TOBINS'Q				**Return on assets**			
	1	2	3	4	5	6	7	8
NEXP	0.375		0.21		0.005		0.008**	
	(0.645)		0.196		0.011		0.003	
INADJ		10.445***		−0.187		0.115*		0.039*
		(3.570)		(1.184)		(0.064)		(0.021)
TAST	0.504	0.940***			0.001	0.014***		
	(0.470)	(0.253)			(0.008)	(0.004)		
FAGE			0.012	−0.005			−0.0001	−0.0004*
			(0.022)	(0.012)			(0.0004)	(0.0002)
ROA	0.168	0.103	0.219	0.383				
	(1.707)	(1.697)	(1.694)	(1.690)				
ASTGTH	3.252***	3.024***	2.652***	2.781***	0.119***	0.117***	0.107***	0.109***
	(0.772)	(0.774)	(0.777)	(0.773)	(0.013	(0.013)	(0.013)	(0.013)
DBTAST	0.971***	0.805**	0.824**	0.896***	−0.051***	−0.052***	−0.057***	−0.057***
	(0.330)	(0.332)	(0.321)	(0.322)	(0.006)	(0.006)	(0.005)	(0.005)
LEV	−0.304***	−0.306***	−0.285***	−0.279***	0.004***	0.004***	0.005***	0.005***
	0.058	0.057	0.057	0.057	0.001	0.001	0.001	0.001
MCAP	0.000***	0.000***	0.000***	0.000***	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP	−0.004***	−0.003***	−0.004***	−0.004***	0.00003*	0.00004**	0.00003*	0.00003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
BSIZE	−0.173**	−0.122*	−0.155**	−0.108*	−0.003**	−0.002	−0.001	−0.001
	(0.068)	(0.063)	(0.063)	(0.061)	(0.001)	(0.001)	(0.001)	(0.001)
INDCE	−0.831	−0.416	−0.240	−0.258	0.084***	0.083***	0.098***	0.098***
	(0.878)	(0.876)	(0.879)	(0.876)	(0.015)	(0.015)	(0.015)	(0.015)
BGD	−0.254	−0.404	0.096	0.122	−0.008	−0.005	−0.001	0.003
	(0.720)	(0.719)	(0.753)	(0.750)	(0.013)	(0.013)	(0.013)	(0.013)
MDIR	−1.144**	−1.078**	−1.039**	−1.132**	0.011	0.01	0.015*	0.014*
	(0.476)	(0.474)	(0.473)	(0.471)	(0.008)	(0.008)	(0.008)	(0.008)
CDUAL	0.851	0.781	0.831	0.839	0.002	0.002	0.001	0.002
	(0.572)	(0.569)	(0.571)	(0.571)	(0.010)	(0.010)	(0.010)	(0.010)
AGRIC	0.974	1.826*	1.213	1.291	0.129***	0.119***	0.131***	0.122***
	(0.901)	(0.979)	(0.909)	(0.991)	(0.015)	(0.017)	(0.016)	(0.017)
BEV	1.348	2.019**	1.984**	1.814*	0.051***	0.047***	0.060***	0.055***
	0.902	0.953	0.938	0.981	0.016	0.017	0.017	0.017
BDAST	0.851	1.977*	1.274	1.591	0.092***	0.069***	0.100***	0.079***
	(0.864)	(1.080)	(0.877)	(1.058)	(0.015)	(0.019)	(0.015)	(0.019)
CHEM	2.978*	4.635**	2.335	2.324	−0.065**	−0.058*	−0.080***	−0.088***
	1.742	1.802	1.71	1.714	0.031	0.032	0.03	0.031
COMM	0.628	1.17	0.485	0.259	−0.013	−0.003	−0.024	−0.014
	(1.227)	(1.228)	(1.213)	(1.227)	(0.022)	(0.022)	(0.022)	(0.022)
ENGY	1.115	2.421*	1.285	1.96	0.077***	0.034	0.078***	0.042*
	(0.832)	(1.241)	(0.832)	(1.214)	(0.015)	(0.022)	(0.015)	(0.022)
ENG	1.474	2.354**	1.702*	1.594	0.025	0.016	0.024	0.016
	(0.926)	(0.982)	(0.930)	(0.984)	(0.016)	(0.018)	(0.017)	(0.018)
FD	3.054***	4.344***	3.474***	3.949***	0.078***	0.050**	0.085***	0.060***
	(0.847)	(1.142)	(0.860)	(1.112)	(0.015)	(0.020)	(0.015)	(0.020)
HLTH	−0.820	−0.329	−0.668	−0.640	0.026	0.025	0.031	0.029

Table 6 (continued)

	TOBINS'Q				Return on assets			
	(1.076)	(1.087)	(1.074)	(1.082)	(0.019)	(0.019)	(0.019)	(0.019)
INDHD	0.612	1.57	0.794	1.092	0.039**	0.013	0.039**	0.016
	(0.876)	(1.076)	(0.882)	(1.059)	(0.015)	(0.019)	(0.016)	(0.019)
INVST	0.384	0.825	0.748	0.325	0.063***	0.045*	0.063**	0.045*
	(1.387)	(1.354)	(1.403)	(1.354)	(0.024)	(0.024)	(0.025)	(0.024)
MNG	1.301	1.870*	1.399	1.262	−0.001	−0.012	−0.004	−0.016
	(1.022)	(1.043)	(1.037)	(1.034)	(0.018)	(0.019)	(0.019)	(0.018)
PAPK	0.772	2.596	0.606	0.362	0.021	0.033	0.003	0.007
	(1.538)	(1.627)	(1.513)	(1.514)	(0.027)	(0.029)	(0.027)	(0.027)
PHARM	0.270	1.14	0.475	0.456	0.056***	0.055***	0.056***	0.054***
	(0.936)	(0.981)	(0.939)	(0.971)	(0.016)	(0.017)	(0.017)	(0.017)
PUBPRT	−0.075	0.791	−0.057	−0.104	0.091***	0.078***	0.086***	0.074***
	(0.930)	(0.990)	(0.924)	(0.976)	(0.016)	(0.017)	(0.016)	(0.017)
PTY	−0.939	−1.699	−0.540	−0.530	0.002	0.014	0.016	0.008
	(1.178)	(1.230)	(1.170)	(1.170)	(0.021)	(0.022)	(0.021)	(0.021)
RET	0.667	1.499	1.135	0.897	0.097***	0.093***	0.101***	0.099***
	(0.978)	(1.021)	(0.991)	(1.046)	(0.017)	(0.018)	(0.017)	(0.018)
SUPSS	−1.728	−2.259*	−1.075	−1.158	0.059***	0.041*	0.071***	0.060***
	(1.287)	(1.300)	(1.275)	(1.266)	(0.023)	(0.023)	(0.023)	(0.023)
TECH	2.682***	3.663***	2.620***	2.742***	0.104***	0.087***	0.103***	0.087***
	(0.890)	(1.006)	(0.888)	(0.980)	(0.015)	(0.018)	(0.016)	(0.017)
TRSM	−0.080	0.555	−0.108	−0.166	0.072***	0.065***	0.069***	0.061***
	(0.949)	(0.976)	(0.951)	(0.966)	(0.017)	(0.017)	(0.017)	(0.017)
TT	−0.049	0.825	−0.151	−0.095	0.087***	0.077***	0.079***	0.068***
	(0.906)	(0.979)	(0.902)	(0.951)	(0.016)	(0.017)	(0.016)	(0.017)
NEXP: TAST	−0.043				0.002			
	(0.079)				(0.001)			
INADJ: TAST		−1.425***				−0.007		
		(0.448)				(0.008)		
NEXP: FAGE			−0.005				−0.00003	
			(0.004)				(0.0001)	
INADJ: FAGE				−0.022				0.0002
				(0.020)				(0.0004)
Obs	1128	1128	1128	1128	1128	1128	1128	1128
R^2	0.14	0.15	0.14	0.14	0.44	0.44	0.44	0.43
Adj. R^2	0.11	0.120	0.11	0.11	0.43	0.42	0.42	0.42
Constant	4.846	−0.399	8.944***	9.660***	−0.149*	−0.233***	−0.144***	−0.112**
	(4.393)	(3.221)	(2.706)	(2.503)	(0.078)	(0.057)	(0.048)	(0.045)

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$. All continuous predictors were mean-centred and scaled by one standard deviation. The standard errors are heteroscedasticity-robust

dependent metrics of financial performance, our independent variables aimed at quantifying board expertise diversity through innovative measures, including the expertise index, the number of experts on the board, and the industry-adjusted number of experts.

Generally, the study crucially uncovers that a broad spectrum of expertise among the directors of publicly traded companies in sub-Saharan Africa is positively associated with enhanced financial performance, precisely when gauged through ROA. Furthermore, the study clarifies how the sizes of the firms considerably reduce the association between board expertise diversity and firm value. This is consistent with the academic discourse, which holds that the burdens of core rigidity and hierarchical inertia, common in larger establishments, impede the board's innovative contributions,

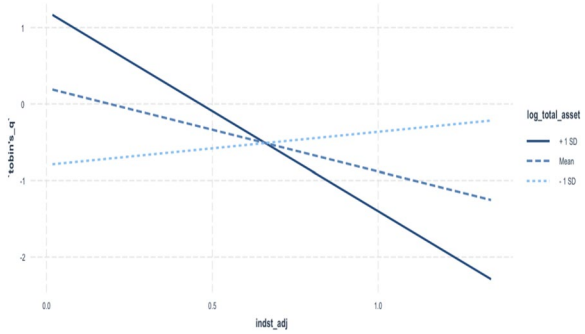

Fig. 3 Interaction effect of firm size on the link between industry-adjusted number of expertise and Tobin's Q. *Source* Slope analysis of the effect of firm size on industry-adjusted number of expertise – firm value nexus using the interaction package in R developed by [61]

reducing their impact on organisational performance. While the influence of firm age on this dynamic emerges as unfavourable, it does not attain statistical significance. Intriguingly, our exploration concludes that the diversity of expertise present on corporate boards is relatively insignificant in the market valuation of the firms.

These insights dovetail with the theoretical underpinnings posited by resource dependence, agency theory, and convergence theory, collectively advocating that a board imbued with an optimal incorporation of expertise, skills, and a commitment to exemplary corporate governance practices can markedly elevate a firm's financial performance. Consequently, it is posited that corporate boards characterised by a rich blend of expertise and skills are instrumental in significantly propelling the financial outcomes of companies, with a pronounced effect observed in smaller, relatively nascent firms compared to their larger, more established counterparts.

Practical implications

The results imply that listed companies in developing nations will perform better financially if their corporate boards retain a suitable balance of professional expertise. Thus, corporate managers and practitioners are encouraged to appoint an appropriate mix of experts to their boards to improve their companies' financial performance. Similarly, policymakers can update corporate governance regulations to encourage more diverse boards, such as mandating that individuals with specific expertise fill certain board positions to bring new perspectives into boardroom decision-making to improve a firm's financial performance. Additionally, the study highlights the detrimental impact that firm age and size have on the board expertise diversity and the financial performance nexus of listed firms. Based on the findings, care should be taken when populating corporate boards with diverse expertise, especially for well-established and older firms.

Limitations and suggestions for future research

Cross-sectional data from Ghana, Nigeria, and Kenya are used in this study to examine the relationship between firm performance and the diversity of expertise on corporate boards. Therefore, the econometric model we chose imposed a constraint on our ability to consider the time-variant dimensions of the data. Therefore, future studies should consider employing a balanced panel data set to account for the temporal dimensions of the data. Once more, despite adding to the existing literature, the results may have limited applicability because they are concentrated in just three sub-Saharan English-speaking nations. Thus, additional research ought to be conducted in other francophone African countries. Lastly, the observed negative moderating impact of firm age and size on the relationship between board expertise diversity and firms' return on assets (ROA) may result from exogenous factors that the current study may have missed. Further investigation into the reasons behind these factors' detrimental effects on a firm's financial performance can advance this field of study.

Abbreviations

AGRIC	Agricultural
AGRIND	Agric-industrial
ASGTH	Asset growth
BEV	Beverages
BGD	% Females directors
BEXP	Business expertise
BSIZE	Board size
CDUAL	CEO duality
CHEM	Chemicals
COMM	Communications
DBTAST	Debt to assets
ENGY	Energy
ENGR	Engineering
EXPIND	Expertise index
FD	Food
FAGE	Firm age
GDP	Gross domestic product
HLTH	Health
INADJ	Industry-adjusted number of expertise
INDCE	% Independent directors
INDHD	Industrial holding
INVST	Investment
LEV	Leverage
MDIR	% Multiple directorships
MKCAP	Market capitalisation
MNG	Mining
NXP	Number of expertise
OEXP	Other expertise
PAPG	Paper & Packaging
PHARM	Pharmaceuticals
PRTPUB	Printing and publishing
PTY	Property
RET	Retail
ROA	Return on assets
SUPSS	Support services
TAST	Ln (Total assets)
TBQ	Tobin's Q

TECH	Technology
TT	Transport
TRSM	Tourism

Acknowledgements
Not applicable.

Author contributions
FKD and MA contributed to the conceptualisation and original write-up. FKD, MA, and BSD helped with the literature review, methodology, proofreading, and editing. FKD, MA, and KBP worked on model estimation, discussion, and conclusion. All authors have reviewed and accepted the paper.

Funding
No financial contribution from the public and private agencies is associated with the work.

Availability of data and materials
The study's data sources have been highlighted in the manuscript. However, we declare that upon reasonable request, the corresponding author can provide the data used in the study and other related materials if needed.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no conflict of interest.

Received: 1 January 2024 Accepted: 10 August 2024
Published online: 21 August 2024

References

1. Aboagye-Otchere F, Bedi I, Ossei Kwakye T (2012) Corporate governance and disclosure practices of Ghanaian listed companies J Account Emerg Econ 2(2):140–161
2. Adams RB, de Haan J, Terjesen S, van Ees H (2015) Board diversity: moving the field forward. Corp Gov Int Rev 23(2):77–82. https://doi.org/10.1111/corg.12106
3. Adams RB, Ferreira D (2009) Women in the boardroom and their impact on governance and performance. J Financ Econ 94(2):291–309. https://doi.org/10.1016/j.jfineco.2008.10.007
4. Adeabah D, Gyeke-Dako A, Andoh C (2019) Board gender diversity, corporate governance and bank efficiency in Ghana: a two stage data envelope analysis (DEA) approach. Corp Gov (Bingley) 19(2):299–320. https://doi.org/10.1108/CG-08-2017-0171
5. Adusei M (2019) Board gender diversity and the technical efficiency of microfinance institutions: does size matter? Int Rev Econ Financ 64:393–411. https://doi.org/10.1016/j.iref.2019.07.008
6. Adusei M, Obeng EYT (2019) Board gender diversity and the capital structure of microfinance institutions: a global analysis. Q Rev Econ Financ 71:258–269. https://doi.org/10.1016/j.qref.2018.09.006
7. Agarwal S (2020) Literature review on the relationship between board structure and firm performance (SSRN Scholarly Paper 3799977). https://papers.ssrn.com/abstract=3799977
8. Aifuwa HO, Saidu M (2020) Board cognitive diversity and firm performance nexus: evidence from Nigeria (SSRN Scholarly Paper 3718600). https://papers.ssrn.com/abstract=3718600
9. Alhababsah S, Yekini S, Yekini S (2021) Audit committee and audit quality: an empirical analysis considering industry expertise, legal expertise and gender diversity. J Int Account Audit Tax 42:100377. https://doi.org/10.1016/j.intaccaudtax.2021.100377
10. Al-Shammari MA, Banerjee S, Shah T, Doty H, Al-Shammari H (2022) The value of expertise: how chief executive officer and board corporate social responsibility expertise enhance the financial effects of firms' corporate social responsibility initiatives. Soc Bus Rev. https://doi.org/10.1108/SBR-10-2021-0183
11. Amable B (1993) Catch-up and convergence: a model of cumulative growth Int Rev Appl Econ 7(1):1–25
12. Anarfo EB, Abor JY, Osei KA (2019) Financial regulation and financial inclusion in Sub-Saharan Africa: does financial stability play a moderating role? Res Int Bus Financ. https://doi.org/10.1016/j.ribaf.2019.101070
13. Anderson RC, Reeb DM, Upadhyay A, Zhao W (2011) The economics of director heterogeneity. Financ Manage 40(1):5–38. https://doi.org/10.1111/j.1755-053X.2010.01133.x
14. Andrews DW, Monahan JC (1992) An improved heteroskedasticity and autocorrelation consistent covariance matrix estimator. Econom J Econom Soc 60:953–966
15. Arnegger M, Hofmann C, Pull K, Vetter K (2014) Firm size and board diversity. J Manage Gov 18(4):1109–1135. https://doi.org/10.1007/s10997-013-9273-6
16. Assenga MP, Aly D, Hussainey K (2018) The impact of board characteristics on the financial performance of Tanzanian firms. Corp Gov (Bingley) 18(6):1089–1106. https://doi.org/10.1108/CG-09-2016-0174
17. Badu LA, Appiah KO (2017) The impact of corporate board size on firm performance: evidence from Ghana and Nigeria. Res Bus Manag 4(2):1. https://doi.org/10.5296/rbm.v4i2.11721
18. Balogh A (2016) Professional expertise on boards, corporate lifecycle, and firm performance. https://doi.org/10.2139/ssrn.2802417
19. Boadi I, Osarfo D (2019) Diversity and return: the impact of diversity of board members' education on performance. Corp Gov (Bingley) 19(4):824–842. https://doi.org/10.1108/CG-01-2019-0017
20. Bokpin GA, Ackah C, Kunawotor ME (2018) Financial access and firm productivity in Sub-Saharan Africa. J Afr Bus 19(2):210–226. https://doi.org/10.1080/15228916.2018.1392837
21. Boone AL, Casares Field L, Karpoff JM, Raheja CG (2007) The determinants of corporate board size and composition: an empirical analysis. J Financ Econ. https://doi.org/10.1016/j.jfineco.2006.05.004
22. Boubacar H (2020) Women's presence in top management and the performance of microfinance institutions in West Africa. Int J Soc Econ 47(2):207–222. https://doi.org/10.1108/IJSE-06-2019-0365
23. Butt MN, Baig AS, Seyyed FJ (2021) Tobin's Q approximation as a metric of firm performance: an empirical evaluation. J Strateg Mark. https://doi.org/10.1080/0965254X.2021.1947875
24. Campbell K, Mínguez-Vera A (2008) Gender diversity in the boardroom and firm financial performance. J Bus Ethics 83(3):435–451. https://doi.org/10.1007/s10551-007-9630-y
25. Capasso A, Gallucci C, Rossi M (2015) Standing the test of time. Does firm performance improve with age? An analysis of the wine industry. Bus Hist 57(7):1037–1053. https://doi.org/10.1080/00076791.2014.993614
26. Chen S-S, Chen Y-S, Kang J-K, Peng S-C (2020) Board structure, director expertise, and advisory role of outside directors. J Financ Econ 138(2):483–503. https://doi.org/10.1016/j.jfineco.2020.05.008
27. Child J (1975) Managerial and organizational factors associated with company performance-part Ii. A contingency analysis. J Manag Stud 12(1–2):12–27. https://doi.org/10.1111/j.1467-6486.1975.tb00884.x
28. Coad A, Holm JR, Krafft J, Quatraro F (2018) Firm age and performance. J Evol Econ. https://doi.org/10.1007/s00191-017-0532-6
29. Cuervo-Cazurra A, Mudambi R, Pedersen T (2019) Subsidiary power: Loaned or owned? The lenses of agency theory and resource dependence theory. Glob Strateg J 9(4):491–501. https://doi.org/10.1002/gsj.1362
30. Dalton DR, Daily CM, Ellstrand AE, Johnson JL (1998) Meta-analytic reviews of board composition, leadership structure, and financial performance. Strateg Manag J 19(3):269–290. https://doi.org/10.1002/(sici)1097-0266(199803)19:3%3c269::aid-smj950%3e3.3.co;2-b
31. Dalziel T, Gentry RJ, Bowerman M (2011) An integrated agency–resource dependence view of the influence of directors' human and relational capital on firms' R&D spending J Manag Stud 48(6):1217–1242

32. D'Amato A, Falivena C (2020) Corporate social responsibility and firm value: Do firm size and age matter? Empirical evidence from European listed companies. Corp Soc Responsib Environ Manag 27(2):909–924
33. Dezsö CL, Ross DG (2012) Does female representation in top management improve firm performance? A panel data investigation. Strateg Manag J 33(9):1072–1089. https://doi.org/10.1002/smj.1955
34. Dharwadkar R, Guo J, Guo J, Shi L, Yang R (2021) Corporate social irresponsibility and boards: the implications of legal expertise. J Bus Res 125:143–154. https://doi.org/10.1016/j.jbusres.2020.12.003
35. EL Ammari A (2022) Does political connection affect corporate financial performance? The moderating role of directors' financial expertise. J Financ Report Account. https://doi.org/10.1108/JFRA-08-2021-0257
36. Ettredge ML, Li C, Wang Q, Xu Y (2021) Executive board member financial expertise and IPO performance. Account Horiz 35(1):47–64. https://doi.org/10.2308/HORIZONS-18-020
37. Faleye O, Hoitash R, Hoitash U (2018) Industry expertise on corporate boards. Rev Quant Financ Acc 50(2):441–479. https://doi.org/10.1007/s11156-017-0635-z
38. Fama EF, Jensen MC (1983) Separation of ownership and control. J Law Econom 26(2):301–325. https://doi.org/10.1086/467037
39. Fadilah F, Uzliawati L, Mulyasari W (2022) The effect of firm size and firm age on sustainability reporting and the impact on earnings management. Jurnal Riset Akuntansi Terpadu 15(1):84–84. https://doi.org/10.35448/jrat.v15i1.14510
40. Fernández-Temprano MA, Tejerina-Gaite F (2020) Types of director, board diversity and firm performance. Corp Gov (Bingley) 20(2):324–342. https://doi.org/10.1108/CG-03-2019-0096
41. García-Ramos R, Díaz BD (2021) Board of directors structure and firm financial performance: a qualitative comparative analysis. Long Range Plan 54(6):102017. https://doi.org/10.1016/j.lrp.2020.102017
42. Gathaiya RN (2017) Analysis of issues affecting collapsed banks in Kenya from year 2015 to 2016. Int J Manag Bus Stud 7(3):9–15
43. Goel A, Dhiman R, Rana S, Srivastava V (2022) Board composition and firm performance: empirical evidence from Indian companies. Asia-Pac J Bus Adm. https://doi.org/10.1108/APJBA-09-2021-0483
44. Gray S, Nowland J (2017) The diversity of expertise on corporate boards in Australia. Account Finance 57(2):429–463. https://doi.org/10.1111/acfi.12146
45. Hair JF, Page M, Brunsveld N (2020) Essentials of business research methods, 4th edn. Routledge, Milton Park
46. Hambrick DC, Mason PA (1984) Upper echelons: the organization as a reflection of its top managers. Acad Manag Rev. https://doi.org/10.2307/258434
47. Harjoto MA, Laksmana I, Yang Y, wen. (2019) Board nationality and educational background diversity and corporate social performance. Corp Gov (Bingley) 19(2):217–239. https://doi.org/10.1108/CG-04-2018-0138
48. Hermalin BE, Weisbach MS (2003) Boards of directors as an endogenously determined institution a survey of the economic literature. Econom Policy Rev. https://doi.org/10.3386/w8161
49. Howell KE, Sorour MK, Karim Sorour M (2016) Corporate governance in Africa. Palgrave Macmillan, London
50. Huy DTN (2015) The critical analysis of some comparative Eastern Africa corporate governance standards after financial crisis, corporate scandals and manipulation. Int J Res Bus Manag Account 1(1):54–63. https://doi.org/10.53555/bma.v1i1.1670
51. Ishaq M, Islam Y, Ghouse G (2021) Tobin's Q as an indicator of firm performance: empirical evidence from manufacturing sector firms of Pakistan. Int J Econ Bus Adm 1:425–441
52. Kagzi M, Guha M (2018) Board demographic diversity: a review of literature. J Strateg Manag 11(1):33–51. https://doi.org/10.1108/JSMA-01-2017-0002
53. Khemakhem H, Fontaine R (2019) The audit committee chair's abilities: beyond financial expertise. Int J Audit 23(3):457–471. https://doi.org/10.1111/ijau.12173
54. Kiel GC, Nicholson GJ (2003) Board composition and corporate performance: how the Australian experience informs contrasting theories of corporate governance. Corp Gov Int Rev 11(3):189–205. https://doi.org/10.1111/1467-8683.00318
55. Kim D, Starks LT (2016) Gender diversity on corporate boards: do women contribute unique skills? Am Econ Rev 106(5):267–271. https://doi.org/10.1257/aer.p20161032
56. Komal B, Bilal, Ezeani E, Shahzad A, Usman M, Sun J (2023) Age diversity of audit committee financial experts, ownership structure and earnings management: evidence from China. Int J Finance Econom 28(3):2664–2682
57. Kücher A, Mayr S, Mitter C, Duller C, Feldbauer-Durstmüller B (2020) Firm age dynamics and causes of corporate bankruptcy: age dependent explanations for business failure. RMS 14(3):633–661. https://doi.org/10.1007/s11846-018-0303-2
58. Lee J, Park J (2019) The impact of audit committee financial expertise on management discussion and analysis (MD&A) tone. Eur Account Rev 28(1):129–150
59. Lending CC, Vähämaa E (2017) European board structure and director expertise: the impact of quotas. Res Int Bus Financ 39:486–501. https://doi.org/10.1016/j.ribaf.2016.09.004
60. Li H, Chen P (2018) Board gender diversity and firm performance: the moderating role of firm size. Bus Ethics 27(4):294–308. https://doi.org/10.1111/beer.12188
61. Long JA (2019) Interactions: comprehensive, user-friendly toolkit for probing interactions. R package version 1.1. 0. The Comprehensive R Archive Network.
62. Lorsch JW (2017) Understanding boards of directors: a systems perspective. Crit Financ Rev 2(1):1–49. https://doi.org/10.1561/109.00000006
63. Mallinguh E, Wasike C, Zoltan Z (2020) The business sector, firm age, and performance: the mediating role of foreign ownership and financial leverage. Int J Financ Stud 8(4):79. https://doi.org/10.3390/ijfs8040079
64. Mathew S, Puwanenthiren P, Sivaprasad S (2020) The value effects of digital expertise on corporate boards. https://doi.org/10.2139/ssrn.3716771
65. Meng X, Tian JJ (2020) Board expertise and executive incentives. Manage Sci 66(11):5448–5464. https://doi.org/10.1287/mnsc.2019.3355
66. Munisi GH (2020) Corporate governance and ownership structure in sub-saharan Africa Countries. J Afr Bus 21(3):289–314. https://doi.org/10.1080/15228916.2019.1646600
67. Nakpodia F, Adegbite E, Amaeshi K, Owolabi A (2018) Neither principles nor rules: making corporate governance work in Sub-Saharan Africa. J Bus Ethics 151(2):391–408. https://doi.org/10.1007/s10551-016-3208-5
68. Newey WK, West KD (1987) Hypothesis testing with efficient method of moments estimation. Int Econ Rev. https://doi.org/10.2307/2526578
69. Nguyen TH, Elmagrhi MH, Ntim CG, Wu Y (2021) Environmental performance, sustainability, governance and financial performance: evidence from heavily polluting industries in China. Bus Strateg Environ 30(5):2313–2331
70. Nguyen T, Nguyen A, Locke S, Reddy K (2017) Does the human capital of board directors add value to firms? Evidence from an Asian market. Cogent Econ Finance 5(1):1385439. https://doi.org/10.1080/23322039.2017.1385439
71. Orazalin N, Baydauletov M (2020) Corporate social responsibility strategy and corporate environmental and social performance: the moderating role of board gender diversity. Corp Soc Responsib Environ Manag 27(4):1664–1676
72. Pfeffer J, Salancik GR (1978) The external control of organizations: a resource dependence perspective.
73. Sako M, Kubo K (2019) Professionals on corporate boards: how do they affect the bottom line? (SSRN Scholarly Paper 3410294). https://doi.org/10.2139/ssrn.3410294
74. Edacherian S, Panicker VS (2021) Do interlocks by different types of directors affect the nature of internationalization strategy of emerging market multinationals. Int Bus Rev. https://doi.org/10.1016/j.ibusrev.2021.101953
75. Sarpong-Danquah B, Adusei M, Frimpong JM (2023) The capital structure–firm performance nexus: the role of judicial efficiency. Manag Decis Econ 44(3):1585–1600. https://doi.org/10.1002/mde.3768
76. Sarpong-Danquah B, Gyimah P, Afriyie RO, Asiama A (2018) Corporate governance and firm performance: an empirical analysis of manufacturing listed firms in Ghana. Account Financ Res 7(3):111. https://doi.org/10.5430/afr.v7n3p111
77. Sarwar B, Xiao M, Husnain M, Naheed R (2018) Board financial expertise and dividend-paying behavior of firms: new insights from the emerging equity markets of China and Pakistan. Manag Decis. https://doi.org/10.1108/MD-11-2017-1111

78. Sierra-Morán J, Cabeza-García L, González-Álvarez N, Botella J (2021) The board of directors and firm innovation: a meta-analytical review. BRQ Bus Res Q. https://doi.org/10.1177/23409444211039856
79. Tchakoute Tchuigoua H (2014) Performance of microfinance institutions: do board activity and governance ratings matter? Finance 35(3):7–52
80. Tchuigoua HT (2015) Determinants of the governance quality of microfinance institutions. Q Rev Econ Finance 58:32–43
81. Terjesen S, Aguilera RV, Lorenz R (2015) Legislating a Woman's Seat on the Board: Institutional Factors Driving Gender Quotas for Boards of Directors. J Bus Ethics 128(2):233–251. https://doi.org/10.1007/s10551-014-2083-1
82. Terjesen S, Couto EB, Francisco PM (2016) Does the presence of independent and female directors impact firm performance? A multi-country study of board diversity. J Manag Gov 20(3):447–483. https://doi.org/10.1007/s10997-014-9307-8
83. Veblen, Thorstein. Imperial Germany and the Industrial Revolution. New York: Viking, [1915] 1954.
84. Vo LV, Le HT (2023) From hero to zero-the case of silicon valley bank. Available at SSRN 4394553.
85. Wang C, Xie F, Zhu M (2015) Industry expertise of independent directors and board monitoring. J Financ Quant Anal 50(5):929–962. https://doi.org/10.1017/S0022109015000459
86. West KD (2010) Heteroskedasticity and autocorrelation corrections. In: Macroeconometrics and time series analysis, pp. 135–144.
87. Withers MC, Hillman AJ, Cannella AA (2012) A multidisciplinary review of the director selection literature. J Manag 38(1):243–277. https://doi.org/10.1177/0149206311428671
88. Wu T-H, Lin M-C, Ting P-JL, Huang JY (2024) Do academic directors matter? Evidence from Taiwan equity market. Int Rev Financ. https://doi.org/10.1111/irfi.12428
89. Yahaya NS, Mohd-Jali MR, Raji JO (2020) The role of financial development and corruption in environmental degradation of Sub-Saharan African countries. Manag Environ Qual Int J 31(4):895–913
90. Yermack D (1996) Higher market valuation of companies with a small board of directors. J Financ Econ 40(2):185–211. https://doi.org/10.1016/0304-405X(95)00844-5
91. Zona F, Gomez-Mejia LR, Withers MC (2018) Board interlocks and firm performance: toward a combined agency-resource dependence perspective. J Manag 44(2):589–618. https://doi.org/10.1177/0149206315579512
92. Zona F, Zattoni A, Minichilli A (2013) A contingency model of boards of directors and firm innovation: the moderating role of firm size. Br J Manag 24(3):299–315. https://doi.org/10.1111/j.1467-8551.2011.00805.x