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| RESEARCH ARTICLE

Board Size, Board Independence, Board Expertise and the Financial Performance of Listed Manufacturing Firms in Ghana: Does Board Commitment Play a Role?

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| ABSTRACT
This study focused on examining how board size, board independence, and board expertise relate to the financial performance of manufacturing companies listed on the Ghana Stock Exchange, considering the moderating role of board commitment. The study population had to do with the listed manufacturing firms in Ghana. This study employed a quantitative research method along with a causal research design. Secondary data (panel) were gathered from the annual financial reports of seven listed manufacturing companies from 2010 to 2022. It was discovered that board size has an insignificant effect on the financial performance (return on asset and return on equity) of listed manufacturing companies in Ghana. Board independence and expertise positively and significantly affect the financial performance of listed manufacturing firms in Ghana. This study found a positive but insignificant moderating effect of board commitment on board size and return on asset nexus. However, board commitment positively and significantly affects board independence and return on asset nexus, board expertise and return on asset nexus, board size and return on equity nexus, board independence and return on equity nexus, and board expertise and return on equity nexus. This study is the first to examine the moderating effect of board commitment on how board size, independence, and expertise relate to the financial performance of listed manufacturing companies. Aligned with the findings, we recommend that the management of listed manufacturing companies implement effective measures to improve the independence, expertise, and commitment of the board of directors.

| KEYWORDS

Board Size, Board Independence, Board expertise, Board Commitment, Financial Performance.

| ARTICLE INFORMATION

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1. Introduction

Corporate boards play a critical role in ensuring the efficient operation of organizations in a worldwide, constantly evolving, and dynamic market environment. In contemporary times, boards are increasingly expected to fulfil the role of providing strategic guidance rather than overseeing management, especially during periods of crisis (Amarayah et al., 2023). In addition to providing support and supervision for management plans, another responsibility involves evaluating, motivating, commending, and disciplining managerial performance (Al Faryan, 2021). Numerous global corporate governance regulations mandate that the board of directors assume the role of committed fiduciaries entrusted with the responsibility of supervising and ensuring appropriate corporate governance within their respective organizations. The core principles of effective corporate governance are accountability, transparency, fairness, and ethical management (Kyere & Ausloos, 2019). The focal point of effective corporate governance is the attributes of the board of directors, and the literature has demonstrated the significance of corporate governance in the success of business firms across the globe. It is unsurprising that the notion of board characteristics is garnering growing scholarly interest.

The collection of distinctive attributes associated with a specific board of directors is commonly referred to as board characteristics (Sethi et al., 2023). Various boards possess distinct characteristics that are most suitable for their respective uses. Several crucial aspects of the board have direct implications for effective corporate governance. These include board duality, board size, board diversity, the balance between non-executive and executive members, the independence of board members, the selection and training of board members, and the role of advisory committees such as nomination, remuneration, and auditing (Borlea et al., 2017). In the context of Ghana's manufacturing sector, the study argues that board characteristics such as board size, board independence, board expertise, and board commitment can play a monumental role in the success of the manufacturing sector if managed strategically. This is supported by the fact that many manufacturing companies in Ghana have experienced poor board performance owing to confusion as to the number of boards to maintain the level of independence, expertise, and commitment that should characterize an effective board. This may occasion a change in the financial performance of manufacturing companies in Ghana.

Considering the above, we propose that manufacturing firms in Ghana assess their financial performance from the angles of board size, independence, and expertise. Financial performance assessment refers to the systematic process of collecting, evaluating, and communicating data pertaining to a company's outcomes, encompassing both financial and nonfinancial aspects (Zabri et al., 2016). The financial performance of a company holds significant importance for a diverse range of stakeholders who rely on this data to inform critical decision-making processes. The financial performance of Ghanaian-listed manufacturing firms can be ascertained by the examination of their annual financial reports that are mandated for publication. Financial performance is also utilized as a broad indicator of a company's financial health in a given financial period (Nombare & Aidoo, 2023). In the context of Ghana's manufacturing sector, we argue that the relationship between board size, independence, expertise, and financial performance may depend on the critical role of board commitment. The size, independence and expertise of the board of directors may play a better role in the success of manufacturing firms if they are more committed. Boards that operate as cohesive units have a shared commitment to the organization's mission and future (Trinh et al., 2023).

Over time, a range of modifications has been implemented with the aim of enhancing organizational governance protocols. These alterations have been undertaken to safeguard stakeholders and facilitate heightened executive supervision, thereby mitigating the occurrence of crises within business organizations. According to Herrera-Echeverri et al. (2018), in 2010, the Securities and Exchange Commission of Ghana released a Code of Best Practices. The corporate governance principles outlined in this context exhibit similarities to those established by the Organization for Economic Cooperation and Development (OECD, 2018). It is our belief that the utilization of these codes will facilitate the performance of the manufacturing sector in Ghana. The manufacturing sector plays a crucial role in the economy, as it accounts for more than 50% of the total gross domestic product (GDP) based on data provided by the Ghana Statistical Service (GSS) (2022). With the data provided by the GSS, the manufacturing sector contributed GHS28 billion ($6.1 billion) to the country's Gross Domestic Product (GDP) in 2017, representing an increase from GHS23.9 billion ($5.2 billion) in 2016 and GHS20.5 billion ($4.4 billion) in 2015. In 2017, this constituted 11.7 percent of the GDP. The contribution of the manufacturing sector to GDP has experienced a slight reduction over the past decade. In the second quarter of 2020, the manufacturing industry in Ghana made a noteworthy contribution of around GHS4.6 billion, equivalent to approximately 755.6 million U.S. dollars, to the nation's GDP. In contrast with the previous quarter, a significant decline was observed. During the studied timeframe, the manufacturing sector's contribution to the GDP exhibited fluctuations, reaching its highest point in the first quarter of 2021, amounting to around 6.8 billion GHS (equivalent to approximately 1.1 billion U.S. dollars).

We acknowledge that the financial performance of a firm is affected by many factors, including corporate governance characteristics such as board independence (e.g. Kyere & Ausloos, 2020; Mishra 2020; Kafidepe et al., 2021; Queiri et al., 2021; Onware et al., 2020; Sarpong-Danquah et al., 2022; Almarayeh et al., 2023), board size (e.g. Onware et al., 2020; Sarpong-Danuqah et al., 2022; Almarayeh et al., 2023), board expertise (e.g. Sidki et al., 2023; Andoh et al., 2023; Almarayeh et al., 2023), and Ejike (2020). However, these studies have yielded inconsistent results. For instance, while Sidki et al. (2023) and Andoh et al. (2023) reported a negative relationship between board expertise and financial performance, Amarayah et al. (2023) found a positive relationship between board expertise and financial performance. Again, whereas Queiri et al. (2021), Mishra (2020), and Kafidepe et al. (2021) found a negative relationship between board independence and financial performance, Sarpong-Danquah et al. (2022) and Kyere and Ausloos (2020) found a positive relationship. These inconsistencies have prompted the need for more studies and consideration of potential moderating variables (Pardo & Román, 2013). In the context of Ghana, a review of existing literature suggests that there is a lack of studies regarding the moderating influence of board commitment on how board size, board independence, and board expertise affect financial performance. Additionally, corporate governance literature in the Ghanaian context has focused much on the banking sector (especially universal banks), and the manufacturing sector has received inadequate attention. Drawing on the above, this study focuses on two objectives: to examine the effect of board size, board independence, and board expertise on the financial performance of listed manufacturing firms in Ghana and to examine the

moderating effect of board commitment on how board size, board independence, and board expertise affect the financial performance of listed manufacturing firms in Ghana.

The significance of corporate governance has increased in recent times owing to the growth and transformation of firms in both developed and emerging nations (Saleh et al., 2020). This study makes a valuable contribution to the existing literature on board characteristics (board size, board independence, board expertise, and board commitment) and financial performance by addressing some gaps in the literature. Additionally, this study serves as a foundation for future research. Furthermore, it will enhance the process of policy formulation in the realm of corporate governance. The implications of this study hold potential value for enterprises, legislators, professional organizations, and the broader public, as the fulfillment of governance standards incurs significant costs. This study enhances the understanding of board dynamics and highlights significant considerations pertaining to the nomination of the board of directors in Ghana. The influence of this study on the financial performance of manufacturing companies is anticipated to generate an economic upturn.

2. Literature Review and Hypothesis Development

2.1 Theoretical Framework

This study is anchored on stakeholder theory. The stakeholder theory was coined by Freeman in 1984. Contemporary managers exhibit a broader scope of responsibilities beyond the basic dissemination of information to shareholders (de Villiers and van Staden, 2011). To retain authority over essential resources, it is imperative for managers to communicate effectively with stakeholders, as emphasized by Hill and Jones (1992). The argument of stakeholders other than shareholders on a company's resource allocation arises from the reciprocal dependence on resources, as highlighted by Kock et al. (2012). Consequently, the principal-agent relationship is expanded to encompass the interaction between managers and stakeholders under the stakeholder framework (Kock et al., 2012). This theory serves as a supplementary component to the agency perspective, which posits that managers, as agents, act in the best interests of shareholders, who are the principals. However, there has been a shift in perspective regarding the exclusive emphasis on shareholders, leading to a requirement for boards to take into account the concerns and interests of many stakeholders beyond shareholders (Liu et al., 2015).

Although Jensen and Murphy's (2004) stakeholder theory of diversity is widely recognized, it has not been extensively examined through empirical research. The mismatch between theory and evidence is influenced by a minimum of two variables. The initial concern pertains to the presence of externalities and monopolistic conditions. The second concern pertains to the aspect of measurement, specifically in relation to the challenges associated with acquiring a precise assessment of the firm's long-term value. According to Jensen (2001), stakeholder theory posits that management action should prioritize the cultivation and sustenance of relationships with all stakeholders rather than solely focusing on shareholders. The incompatibility between shareholder primacy and stakeholder theory has led to a significant body of literature advocating for one perspective over the other (Darko et al., 2016; Liu et al., 2015; Borlea et al., 2017; Assenga et al., 2018; Kyere & Ausloos, 2020). Based on robust empirical and theoretical support for stakeholder theory, the researcher advocates for more investigation and discourse to facilitate the advancement of the theory and the identification of optimal strategies for its implementation inside businesses.

This theory is relevant to the study as it links corporate governance to financial performance by emphasizing the need to create value for all stakeholders to be able to create value for investors. The concept of business purpose pertains to the expectations that a firm holds for the contributions it anticipates from its stakeholders, as well as the strategies employed to motivate and encourage these stakeholders to fulfill their respective commitments. The pursuit of profit maximization assumes a pivotal role in shaping a company's operational framework and overall business strategy. Profitability ensues when a corporation accurately identifies and subsequently achieves its business objectives. Adopting a stakeholder perspective is, thus, a cognitive approach that facilitates comprehension of a firm's underlying objectives.

This study is also supported by resource dependency theory. Pfeffer (1972) introduced resource dependency theory, positing that boards play a crucial role in reducing organizational dependence and acquiring essential resources for enterprises. Pfeffer (1972) presented a thorough examination of strategies that businesses might employ to reduce their reliance on and vulnerability to environmental factors. According to Kor and Misangyi (2008), the application of resource dependence theory offers a more efficacious framework for examining boards. Pfeffer (1972) utilized the concepts of board size and composition, specifically ownership structure, as indicators of the board's ability to provide crucial resources to the organization. We argue that the size, independence, and expertise of the board of directors better represent the board's ability to provide adequate resources to its organization. The number of people present on the board, the ratio of non-executive directors, and the qualifications in terms of education, profession, and financial knowledge provide a better reflection of the human resources a manufacturing company has on its board. The notion of resource dependence posits that organizations are unable to sustain themselves independently because of a deficiency in resources (Pfeffer & Salancik, 2003). According to Kiel and Nicholson (2003), the board of directors plays a pivotal role in anchoring the external environment of an organization because of its access to external resources such as financial and

human capital, technology, and critical information. The utilization of these resources can enhance the effectiveness and legitimacy of strategic decision making within organizations (Lückerath-Rovers, 2013).

The theoretical framework of resource dependency lays the foundation for understanding the board's function as a company's resources (Hillman & Dalziel, 2003). The social capital and knowledge possessed by a director may potentially contribute to the effectiveness of a company's board of directors, as highlighted by Darko et al. (2016). In essence, the theory posits that organizations strive to exercise influence over their environment by mobilizing the resources necessary for achieving success (Pfeffer & Salanick, 1978).

This theory is relevant to the study because the strategic addition of critical resources to the board of directors serves as a mechanism to mitigate dependence and thereby enhance the overall performance of the organization. Furthermore, the inclusion of external directors on a firm's board of directors can bring about several benefits. These benefits include enhanced legitimacy, improved access to important stakeholders like suppliers, consumers, public policy makers, and social organizations, as well as the provision of valuable knowledge, expertise, and credibility (Hillman & Dalziel, 2003). In response to the financial crisis of 2008, some prominent financial institutions have incorporated risk management specialists into their boardrooms. According to Hillman and Dalziel (2003), the primary objective of board members is to support a firm in its expansion and advancement. Overall, the resource dependence theory encompasses a broad perspective on the talents and knowledge of directors, recognizing them as valuable resources that can be utilized to enhance the performance of the organization.

2.2 The Manufacturing Sector in Ghana

The manufacturing industry in Ghana encompasses 16 out of the 33 sub-sectors listed in the International Standard Industrial Classification (ISIC). In 2013, manufacturing value added (MVA) contributed 5.8% to the country's GDP (Nti, 2015). According to Nti (2015), the top five subsectors in terms of value added were food and drinks (30%), paper and paper products (19%), chemicals and chemical products (13%), other non-metallic products (9%), and textiles (9%). The government's initiative known as "One District, One Factory" presents favorable prospects for the industrialization of the economy. This approach entails the establishment of a factory within each of Ghana's 216 districts as well as the enhancement of supply chains pertaining to crucial sectors such as automobiles and other high-value export commodities.

The industrial sector experienced a notable growth rate of 9.5% in 2017, surpassing the growth rates of 7.9% in 2016 and 3.7% in 2015 (GSS, 2022). Since then, Ghana's manufacturing sector has experienced fluctuating trends, notably a decline in growth. Based on the data presented by the Ghana Statistical Service, the GDP derived from the manufacturing sector in Ghana had a decline, falling from GHS 6070.45 million in the first quarter of 2023 to GHS 4538.66 million in the second quarter of the same year (GSS, 2023). It can also be observed that the manufacturing output of Ghana has experienced fluctuations over the years. According to the data provided by GSS (2023), in 2019, the manufacturing output amounted to $6.94 billion, indicating a modest increase of 1.96% compared to the previous year. Subsequently, in 2020, the manufacturing output witnessed substantial growth, reaching $7.67 billion, which represented a notable increase of 10.48% compared to 2019. Moving forward to 2021, the manufacturing output continued to expand, reaching $8.47 billion, indicating a growth rate of 10.4% compared to the previous year. However, in 2022, there was a significant decline in the manufacturing output, amounting to $7.41 billion, representing a substantial decrease of 12.48% compared to 2021.

According to a survey conducted by PricewaterhouseCoopers (PwC) (2018), the manufacturing sector can be categorized into two distinct subsectors: heavy manufacturing and light manufacturing. Heavy industry encompasses various areas, including but not limited to oil, mining, shipbuilding, cement production, explosives manufacturing, machinery fabrication, and other related industries. Capital-intensive industries require substantial investments in machinery and facilities for manufacturing purposes. The manufacturing sector in Ghana, although considered underdeveloped, plays a substantial role in contributing to the country's GDP. Heavy manufacturing encompasses several industries, such as metal fabrication, incorporation of additives, building activities, cement production, and quarrying operations. According to Nti (2015), the inclusion of light manufacturing in Ghana's economic activities has the potential to enhance the country's output and export portfolio while concurrently fostering job creation, wage growth, and export revenue. Cocoa production, food and agro-processing, textiles and apparel, and pharmaceuticals have been identified as potential catalysts for the growth of light manufacturing in Ghana.

2.3 Financial Performance

The concept of performance pertains to a company's ability to effectively acquire and oversee scarce resources using diverse strategies with the aim of establishing a competitive advantage. The primary type of performance commonly emphasized in literature is financial or economic performance. This study focuses on financial performance. Ahinful et al. (2021) defined financial performance as a comprehensive evaluation of a company's financial well-being throughout a certain timeframe. A firm's financial

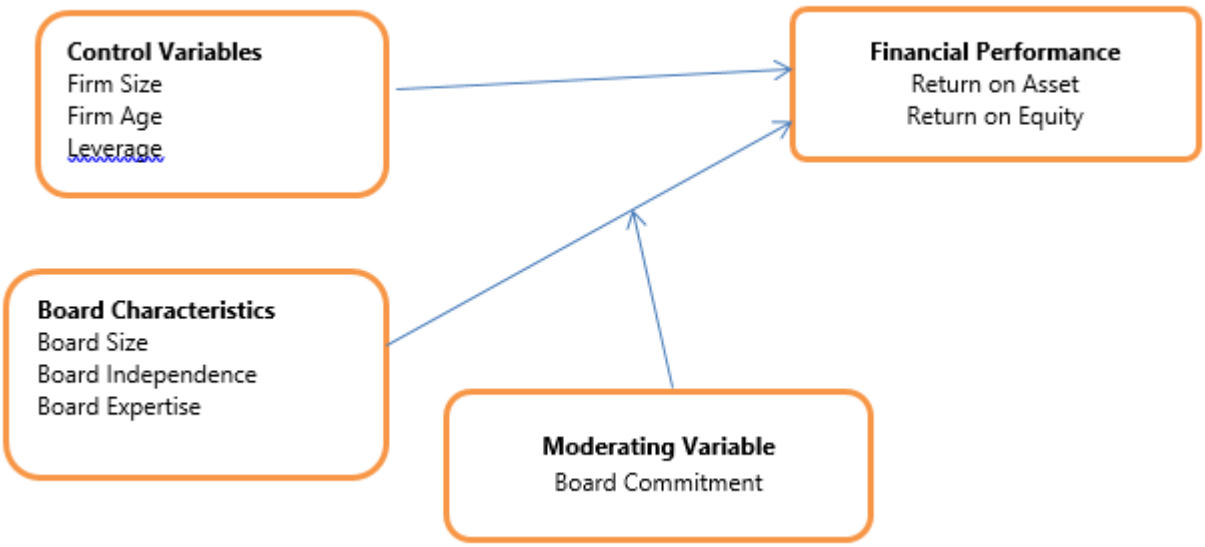
performance pertains to its ability to create revenues and profits by effectively using its assets (Andoh et al., 2023). Financial performance refers to the evaluation of an organization's capacity to effectively manage its financial resources. The evaluation of a firm's financial performance encompasses an analysis of its assets, liabilities, revenue, expenses, equity, and profitability (Ahinful et al., 2021).

The return on assets (ROA) serves as an accounting-based measure of financial performance. Researchers frequently rely on the ROA metric to establish a relationship between different variables and financial performance (Ibrahim, 2011; Marinova et al., 2016). To calculate ROA, the net income of the company must be divided by its total assets. Saleh et al. (2020) also employed a financial performance metric referred to as return on equity (ROE) in their study. The calculation of ROE involves the division of net income (excluding extraordinary items) by the equity of the organization. Furthermore, Cheng et al. (2010) employed earnings per share (EPS) as a metric to assess financial performance by dividing net revenue by the total number of outstanding shares. Tobin's Q (TQ), as per the definition provided by Wen et al. (2023), is a financial metric that quantifies the relationship between a company's market value and its total book value of assets. This calculation involves summing the market prices of a company's shares and debt. Other financial performance measures include quick ratio, current ratio, working capital, gross profit margin, net profit margin, equity multiplier, debt-to-equity ratio, return on equity, return on assets, total asset turnover, inventory turnover, and operating cash flow. However, this study focused on return on equity and return on assets as measures of the financial performance of listed manufacturing firms in Ghana.

2.4 Conceptual Framework

The conceptual framework centers on the underlying assumption that board characteristics such as board size, board independence, and board expertise can result in a change in the financial performance of listed manufacturing firms in Ghana. The framework also supports the argument that the relationship between board size, board independence, board expertise and financial performance of listed manufacturing firms may depend on the level of commitment of the board of directors. To mitigate the influence of extraneous variables such as company size, age, and leverage, they are controlled, and their impacts are eliminated in the observed relationship. The graphical representation in Figure 1 illustrates the conceptual framework.

Figure 1: Conceptual Framework



Source: author's development (2023)

2.5 Board Size and Financial Performance

Board size pertains to the overall count of directors responsible for overseeing a company's corporate governance activities, thereby influencing its success (Onware et al., 2020). Singla and Singh (2019) have highlighted the significance of board size in determining a company's financial decisions. Noor and Fadzil (2013) find that the size of a board plays a significant role in determining its structure and can serve as an indicator of board effectiveness. Furthermore, several studies, including those by Sethi et al. (2023), Gurusamy (2017), Aktan et al. (2018), and Handriani and Robiyanto (2019) have identified a significant and positive effect of the size of a board on financial performance. In contrast, other studies conducted by Aldehayyat et al. (2017) and

Enilolobo et al. (2019) have demonstrated an inverse effect of the size of a board on financial performance. Sarpong-Danquah et al. (2022) argue that managers with self-serving tendencies exert influence on boards to expand beyond their optimal size for value maximization, which may lead to board ineffectiveness. According to Ntim (2015), boards with a large number of members are more susceptible to dysfunction. This is attributed to the challenges they face in reaching a consensus due to the multitude of topics they are required to handle (Abdallah & Tursoy, 2023; Kyere & Ausloos, 2020; Naseem et al., 2017). The expansion of an organization's membership is expected to result in a broader range of perspectives and interpretations as well as an enhanced capacity for supervision within the organization. Consequently, this phenomenon may give rise to a negative or positive relationship between board size and performance.

Based on the shareholder and resource dependency theories, it appears that a larger board would yield greater success. In the context of resource dependency theory, it has been observed that boards comprising a greater number of directors tend to exhibit enhanced resources and effectiveness in the management of organizations. Drawing on this, the study hypothesizes the following:

H_1: Board size contributes significantly and positively to the financial performance of listed manufacturing companies in Ghana.

2.6 Board Independence and Financial Performance

According to Amarayah et al. (2023), independent directors who lack connections to the company's top management are unlikely to influence business decisions. Independent directors play a crucial role in corporate governance by offering a distinct perspective from that of management and shareholders, thus facilitating impartial decision-making and incorporating a broader array of experiences (Ofoeda, 2017; Mensah & Bein, 2023). The principal objective of independent directors is to ensure the adherence of corporations to appropriate protocols to attain their objectives. In line with this, Sarpong-Danquah et al. (2022) demystify that independent directors are expected to possess a higher level of objectivity and impartiality when assessing a company's management and behavior in comparison to executive directors. According to previous research conducted by Jizi et al. (2014) and Fernández-Gago et al. (2016), boards that consist of a significant number of independent directors demonstrate enhanced effectiveness in terms of governance, managerial control, and regulation. In a similar vein, Volonte (2015) argues that the presence of independent directors can effectively mitigate agency conflicts by serving as a robust monitoring mechanism for the board and exhibiting a greater propensity to safeguard the interests of shareholders. However, studies such as Queiri et al. (2021), Mishra (2020), and Kafidepe et al. (2021) found that board independence has a significant and negative effect on financial performance.

The number of independent board members is occasionally regarded as an indicator of effective governance. The essentiality of the board of directors' role as an independent and self-governing entity in overseeing management cannot be overstated. Moreover, the appointment of impartial directors on corporate boards serves as an effective strategy for mitigating potential conflicts between management and shareholders (Asiedu & Mensah, 2023). According to Fernández-Gago et al. (2016), the increased presence of non-executive directors (NEDs) on the board of directors can be attributed to their role as proficient arbitrators and their commitment to the maximization of shareholder value.

There exists a disproportionate presence of external individuals on corporate boards, particularly in the context of independent directors (Naseem et al., 2017; Amarayah et al., 2023). The inclusion of such outsiders enhances the public perception of the firm by showcasing its commitment to effective corporate governance and bolstering the reliability of its financial reporting. A potential solution to mitigate these shortcomings could involve the selection and appointment of competent individuals to serve on the board (Wen et al., 2023). The independence of a board is determined by the presence of independent non-executive directors in this study. Thus, this study hypothesizes the following.

H_2: Board independence positively and significantly contributes to the financial performance of listed manufacturing firms in Ghana.

2.7 Board Expertise and Financial Performance

The experience of the board can serve as a source of inspiration for the CEO's evaluation endeavors and contribute to improved investment decision-making. However, it is important to acknowledge that this expertise may also result in the underreporting of information and potentially diminish the CEO's motivation to properly manage the project. Hillman and Dalziel (2003) find that the cumulative knowledge and skills possessed by members of a company's board serve as indicators of its overall financial performance. According to Sidki et al. (2023), the knowledge of board members plays a key role in the decision-making process. In support of this, Amarayah et al. (2023) find that the cumulative knowledge and skills possessed by board members positively and significantly affect financial performance. Effective supervision of a corporation can be achieved when board members possess a high level of expertise and experience. According to Marinova et al. (2016), the performance of a firm is heavily reliant on the

competency and knowledge of its board members, as per the theory of resource dependency. Agrawal and Chadha (2005) found in their study that boards exhibiting better levels of competency are associated with a reduced frequency of restated earnings.

In contrast, several research findings indicate an inverse relationship between board expertise and organizational performance. For instance, a study conducted by VanNess et al. (2010) reveal a negative relationship between board expertise and firm performance. This implies that the intricacies of day-to-day business operations may exceed the boundaries of professional expertise. The expansion of the organization may necessitate a greater demand for entrepreneurial skills. Similarly, Sidki et al. (2023) find a negative and significant effect of board expertise on the financial performance of 58 state-owned utility companies in Germany. Andoh et al. (2023) also find a negative and significant effect of board expertise on the financial performance of listed commercial banks in Ghana.

Organizations that possess a greater number of experts on their boards are expected to exhibit superior performance due to the experts' enhanced understanding of intricate decision-making processes. The key to establishing a fully functional board is the recruitment of directors who possess the necessary skills and can effectively contribute to the evolving needs of the business. Thus, the third hypothesis is developed.

H_3: Board expertise contributes positively and significantly to the financial performance of listed manufacturing companies in Ghana.

2.8 The Moderating Role of Board Commitment

The research findings indicate a relationship between the annual frequency of meetings attended by individual board members and the collective board and the performance of the board. Chen et al. (2006) claim that the frequency of board meetings is indicative of effective monitoring systems that address various concerns pertaining to the organization, hence influencing its financial performance. The frequency of board activities has been found to influence a board's effectiveness as a monitoring mechanism in mitigating agency conflicts (Trinh et al., 2023). Essentially, the implementation of increased monitoring measures is aimed at mitigating the presence of information asymmetry, thereby enhancing the overall operational effectiveness of businesses (Chou et al., 2013). According to Shivdasani and Yermack (2014), boards should increase the frequency of their meetings when circumstances require heightened supervision and administration.

Based on earlier studies (Trinh et al., 2023; Baldenius et al., 2021), we define board commitment as an individual director's attendance at board meetings. These studies find that regular board meetings, especially when attended by individual members, are associated with increased board performance. In accordance with this concept, boards that convene with greater frequency demonstrate a higher level of commitment. This increases the likelihood of effectively addressing a diverse array of challenges that could jeopardize a firm and hinder its performance (Ejike, 2020). Consequently, this study posits that there exists a positive relationship between board commitment and business performance. With this, we develop the hypothesis below.

H_{4a}: Board commitment positively and significantly moderates the relationship between board size and the financial performance of listed manufacturing firms in Ghana.

H_{4b}: Board commitment positively and significantly moderates the relationship between board independence and the financial performance of listed manufacturing firms in Ghana.

H_{4c}: Board commitment positively and significantly moderates the relationship between board expertise and the financial performance of listed manufacturing firms in Ghana

3. Research Methodology

3.1 Population and Sampling

The population of a study includes all potential factors that can be taken into account for the purpose of data collection (Saunders & Lee, 2017). The study's population encompasses all manufacturing companies that are listed in Ghana. Thirty-nine (39) companies are currently listed on the Ghana Stock Exchange. Among them, eight (8) manufacturing companies are found. The study selects a sample of seven (7) manufacturing companies from the population using the purposive sampling technique. These seven companies were sampled based on the availability of data. Out of the entirety of eight manufacturing organizations, seven of them satisfied the requirements for inclusion, as they had complete data for the duration spanning from 2010 to 2022. The data pertaining to the chosen manufacturing companies is acquired from the publicly available annual financial reports of these firms. According to Wilson (2010), purposive sampling is a non-probability sampling technique wherein the researcher selects persons or entities that meet certain criteria based on the researcher's predetermined objectives. The purposive sampling technique is used because the study targets manufacturing companies that could provide data for analysis.

3.2 Type of Research

Creswell (2012) has observed that the selection of a research method is influenced by the goal of the analysis as well as the type and number of data required. This study employs the quantitative research method that relies on rigorous statistical analysis conducted in a methodical manner. The following are the justifications for employing the quantitative research method: First, the research predominantly depends on quantitative data, specifically focusing on board features and financial performance measurements. Given the utilization of quantitative data, employing a quantitative research strategy is the most suitable approach. Furthermore, given the objectives of this study, which aim to establish the relationship between board characteristics and financial performance, it is deemed suitable to employ the quantitative method.

Saunders and Lee (2017) assert that research design serves as the structural foundation for the systematic collection, analysis, and presentation of research findings. This study aims to examine the effect of board characteristics on financial performance using the causal research design. The causal analysis design is aligned with the positivist research paradigm as it facilitates the identification of a causal relationship between variables under investigation (Turkson, 2011). The causal study design is chosen because it facilitates the elucidation of the causative and consequential relationship between board characteristics (board size, board independence, and board expertise) and financial performance, as well as the moderating effect of board commitment.

3.3 Data for the Study

Secondary data (panel) were utilized to examine the relationship between the selected corporate board characteristics and financial performance while considering the moderating effect of board commitment. Secondary data were obtained from the annual financial reports of seven listed manufacturing companies. The data were acquired from the financial statements of these companies over 13 years, from 2010 to 2022. Consequently, the dataset consisted of 91 observations. One salient feature of panel data is the amalgamation of cross-section and time-series data, yielding a dataset of considerable usefulness (Nombare & Aidoo, 2023). Panel data is derived from a multitude of entities observed at multiple time intervals. The audited annual financial reports of the selected manufacturing companies were downloaded from the website of the Ghana Stock Exchange. In situations where annual reports were not available, we officially placed a request from the company in question indicating the financial years for which annual reports were needed. In all, two months were devoted to data collection.

3.4 Estimation Technique

We processed the collected data using E-views and XL Stats. The study variables are examined using descriptive statistical tools such as mean, standard deviation, maximum, and minimum frequencies. The random effect estimator was employed based on the results provided by the Hausman tests. Following the approaches of Li et al. (2020), Nombare and Aidoo (2023), and Sarpong-Danquah et al. (2022), we ensured the validity of the specified models by conducting the multicollinearity test, the heteroscedasticity test, and the autocorrelation test. Multicollinearity refers to the presence of strong correlations between two or more independent variables inside a regression model (McMillan & Schumacher, 2010). The presence of multicollinearity in a statistical model can result in distorted or deceptive outcomes, impeding the researcher's ability to accurately assess the optimal utilization of each independent variable to comprehend the dependent variable. Heteroscedasticity pertains to a dataset in which the variability of the dependent variable is not constant over the entire range of independent factors (Flick, 2011). The presence of heteroscedasticity in the data leads to regression models producing precise estimates at one extreme of the data range while yielding very imprecise estimates at the other extreme. Autocorrelation has to do with the extent of correlation exhibited by the values of identical variables across distinct observations within the dataset (Turkson, 2011). The presence of autocorrelation within the residuals of a model indicates a potential lack of validity in the model.

The study resorted to the use of the generalized least squares estimation technique. The ordinary least squares (OLS) linear regression models posit that the errors in the dependent variable exhibit no correlation with the independent variable(s). However, due to the potential correlation between some of the independent variables and the error term, as well as the presence of heteroscedasticity and autocorrelation, the study opted to utilize the generalized least squares (GLS) regression method. In situations where the errors display heteroscedasticity or autocorrelation, GLS makes it possible to do an estimate in a more efficient manner since the weights take into consideration these patterns in the data. It must be emphasized that we spent time gathering all relevant reports, leading to the use of a balanced panel dataset to estimate our models.

3.5 Model Specification

The panel data regression models below are specified to examine the effect of board size, board independence, and board expertise on the financial performance (ROA and ROE) of listed manufacturing firms, considering the moderating role of board commitment.

$ROA_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BE_{it} + \beta_4 FS_{it} + \beta_5 FA_{it} + \beta_6 LEV_{it} + \beta_7 (BS*BC)_{it} + \beta_8 (BI*BC)_{it} + \beta_9 (BE*BC)_{it} + \varepsilon_{it}$ .....(1)

$ROE_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 BI_{it} + \beta_3 BE_{it} + \beta_4 FS_{it} + \beta_5 FA_{it} + \beta_6 LEV_{it} + \beta_7 (BS*BC)_{it} + \beta_8 (BI*BC)_{it} + \beta_9 (BE*BC)_{it} + \varepsilon_{it}$ .....(2)

Where

(BS*BC), (BI*BC) and (BE*BC) are classified as interaction variables. ROA stands for return on asset, and ROE stands for return on equity. Other abbreviations used are as follows: BS represents board size, BI represents board independence, BC represents board commitment, BE represents board expertise, FS represents firm size, FA stands for firm age, and LEV represents leverage. β_0 denotes the constant term, whereas β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, and β_9 represent the coefficients (parameters) associated with the selected variables. The symbol t represents time, i represents individual manufacturing firms, and ε_t represents the error term.

3.6 Measurement of Variables

3.6.1 Dependent Variables

This study adopts two dependent variables: return on asset and return on equity. These variables have been proven to accurately measure financial performance in many corporate governance studies (e.g. Sheik & Alom, 2021; Naz et al., 2021; Nasrallah & Khoury, 2021; Igbal et al., 2019; Mbir et al., 2020).

a. Return on Asset

This exemplifies the effective utilization of assets. The return on asset metric quantifies the net revenue earned by the assets of the respective institutions (Sheik & Alom, 2021). This study assesses the capacity of manufacturing firms to enhance profitability through the effective utilization of their assets. Consequently, a higher return on assets (ROA) ratio indicates that the bank is in a more advantageous position to generate greater profitability. The return on asset is determined by employing the formula below.

ROA = Net Profit / Total Asset

b. Return on Equity

Return on equity (ROE) pertains to the percentage of profit generated from an investment in a corporation's stock (Naz et al., 2021). The net income is commonly denoted as the proportion of shareholders' equity. ROE is a financial metric that quantifies the profitability of manufacturing organizations in relation to the investments made by their owners. Consequently, ROE quantifies the financial worth of a bank's profit generated from its equity investment. Return on equity is estimated using the following formula:

ROE = Net Profit / Total Equity

3.6.2 Independent Variables

We chose three independent variables based on the fact that in the manufacturing sector, the independence of the board of directors, their knowledge level, and their required number have received inconsistent results and increased debates as to their effects on financial performance. Additionally, studies by Mbir et al. (2020), Kyere and Ausloos (2020), and Igbal et al. (2019), among others, have emphasized the importance of board independence, board expertise, and board size in changing the financial performance of companies. In the manufacturing sector of Ghana, we argue that these variables have a strong connection with financial performance.

a. Board Size

The concept of board size pertains to the upper or lower limit of directors serving on the board of directors inside an organization (Kyere & Ausloos, 2020). The size of the board is determined by the aggregate number of individuals serving as board members. Constrained board size may result in a deficiency in essential skills and expertise in the context of decision-making. It is possible that a board of smaller size may not possess the capacity to offer the Chief Executive Officer (CEO) sufficient levels of monitoring. Igbal et al. (2019 contended that a larger board of directors exhibits less effectiveness and may potentially give rise to conflicts and instances of free-riding. By contrast, a larger board will contribute to a more diverse range of talents and information to the decision-making process, thereby offering distinct advantages. Furthermore, the expanded board will afford an ample degree of supervision over the Chief Executive Officer. Consequently, this study is expected to reveal a positive relationship between board size and financial performance.

b. Board Independence

Board independence is defined as the number of independent non-executive directors on the board (Almarayeh et al., 2023). A corporate board's composition is assessed by determining the proportion of independent non-executive directors, which is derived by dividing the number of independent members by the total number of individuals serving on the board. Board independence is expected to positively affect financial performance.

c. Board Expertise

Sidki et al. (2022) define board expertise as the individual talents and knowledge possessed by board members. These outcomes are derived from a diverse array of experiences and educational backgrounds. Following the measurement technique employed by Aifuwa and Embele (2019), this study employs a binary dummy variable, with a value of 1 indicating expertise and 0 indicating non-expertise. To serve as a board expert, the board of directors should possess both educational and professional qualifications, along with a minimum of five years of experience in the field of financial issues. Board expertise is expected to positively affect financial performance.

3.6.3 Control Variables

Following recent corporate governance literature (e.g. Hougli et al., 2019; Sheikh & Alom, 2021; Queiri et al., 2021; Mbir et al., 2020), we control for three variables to be able to accurately capture the effect of board independence, board expertise, and board size on financial performance. These variables include firm size, age, and leverage. These variables have been proven to have a strong connection with financial performance.

a. Firm Size

Although it is evident that all assessments of firm size hold statistical significance, it is important to recognize that they are conceptually and practically separate from one another. Moreover, given the fundamental nature of size as a variable, even minor fluctuations in size can exert a substantial impact on the dependent variable and other independent factors within an empirical investigation. According to the study conducted by Orazalin and Mahmood (2018), firm size is measured by taking the natural logarithm of the total assets possessed by the firm. This measurement technique is used in this study.

b. Firm Age

A firm's age can be determined by calculating the time elapsed between its establishment and the present moment, typically denoted in years (Heinrich & Dai, 2016). The quantification of a firm's age can also be achieved by computing the time elapsed between its initial public offering and the present period, denoted in years (Awolabi et al., 2017). This study quantifies the age of a manufacturing firm by assessing the duration that a manufacturing firm has been actively engaged in its operations. The age of a firm is anticipated to have a positive impact on the financial performance of manufacturing firms.

c. Leverage

A firm's leverage refers to its amount of debt in relation to its equity, as measured by its debt-to-equity ratio. A corporation that possesses a higher level of debt in comparison to the typical debt level within its industry is seen as being highly leveraged. The leverage ratio is computed by dividing total debt by total assets. It is expected that leverage will have a positive effect on financial performance.

3.6.4 Moderating Variable

We chose board commitment as the moderating variable because of the important role it plays in firm performance, as revealed by corporate governance literature such as Trinh et al. (2023) and Baldenius et al. (2021). Additionally, we strongly believe that if boards of directors are more committed, the effects of board size, independence, and expertise on financial performance can vary.

a. Board Commitment

According to Trinh et al. (2023), the number of yearly meetings conducted by board members individually and collectively is related to board performance. In line with this, Chen et al. (2006) argue that the frequency of board meetings represents a sound monitoring system that can handle a variety of concerns surrounding the business, which could impact firm performance. The number of board meetings conducted each year is used to measure board commitment. It is anticipated that board commitment will positively moderate how board size, independence, and expertise affect financial performance.

4. Results and Discussion

4.1 Descriptive Statistics of Study Variables

The utilization of descriptive statistics enables the consolidation of data into numerical measures or visual representations (Flick, 2011), facilitating a more comprehensive understanding of the collected data. Table 1 presents a comprehensive overview of the statistical characteristics pertaining to the panel data variables under investigation from 2010 to 2022.

Table 1: Descriptive Statistics

	N	Mean	Standard deviation	Minimum	Maximum
ROA	91	0.3162	0.2040	0.0131	0.7821

ROE	91	0.3330	0.2040	0.0405	0.7820
BS	91	0.2083	0.0622	0.1134	0.2933
BI	91	0.2542	0.0871	0.1241	0.6004
BE	91	0.4920	0.1862	0	1
BC	91	3.7405	0.5001	0.2112	15.1004
FS	91	0.3981	0.5550	0.0233	2.1713
FA	91	18.1021	7.2001	20	32
LEV	91	0.3111	0.5693	0.0544	2.8802

Source: author's calculation (2024)

According to the data presented in Table 1, the average score for listed manufacturing firms' return on assets (ROA) is 0.3162. The mean score exhibits a level of variability, as shown by a standard deviation of 0.2040. This standard deviation implies that the observations for ROA are more clustered around the mean value of 0.3162. ROA for the period 2010–2022 ranged from 0.0131 to 0.7821. The average score for return on equity (ROE) is 0.3330. The mean score exhibits a level of variability represented by a standard deviation of 0.2040. This standard deviation suggests that the observations for ROE are tightly clustered around the mean value of 0.3330. The least recorded value for ROE is 0.0405, while the highest observed value is 0.7820. This indicates that listed manufacturing firms' ROE values for the period 2010 to 2022 range from 0.0405 to 0.7820. Listed manufacturing firms' board size (BS) displays an average score of 0.2083 for 2010 to 2022. The average score of board size exhibits a level of variability, as indicated by a standard deviation of 0.0622. BS has a minimum score of 0.1134 to 0.2933, indicating a range from 0.1134 to 0.2933. The mean score of board independence (BI) from 2010 to 2022 is 0.2542. The mean score shows a degree of variation measured by a standard deviation of 0.0871. The recorded minimum score for BI is 0.1241, while the maximum value is 0.6004. This means that board independence values range from 0.1241 to 0.6004 for the period from 2010 to 2022.

For the period 2010–2022, board expertise (BE) reported a mean score of 0.4920. This mean score shows a degree of variability, as indicated by the standard deviation of 0.1862, implying that the observations for board expertise are tightly clustered around the mean score. BE is a dummy variable that ranges from 0 to 1 throughout the 2010–2022 period. Board Commitment (BC) reports an average score of 3.7405 throughout the time frame from 2010 to 2022. A standard deviation of 0.5001 indicates that the average score has some level of variability. The standard deviation of 0.5001 means that, on average, the difference between the mean and the data points is about 0.5. Firm size (FS) exhibits a minimum score of 0.0233 and a maximum score of 2.1713, indicating a range of 0.0233 to 2.1713 for the period from 2010 to 2022. The average score observed for FS from 2010 to 2022 is 0.3981. A standard deviation of 0.5550 indicates the degree of variability in the average score. The implication is that the data points are close to the mean score of 0.3981. The ages of manufacturing firms (FA) for the period 2010 to 2022 show a mean score of 18.1021, linked to a standard deviation of 7.2001. The standard deviation value of 7.2001 implies that the data points are spread further away from the mean score. The average score of 0.3111 was reported by the leverage (LEV) of listed manufacturing firms for the period from 2010 to 2022. The average score exhibits a level of variability, represented by a standard deviation of 0.5693. Most leverage values are within the range of 0.5693 from the mean value of 0.3111. The observed range of listed manufacturing firms' LEV within the specified time frame is 0.0544 to 2.8802.

4.2 Diagnostic Tests

4.2.1 Multicollinearity Test

The correlation among the independent and moderating variables, as well as the control variables, is presented in Table 2 using a correlation matrix. The existence of high correlation coefficients among these variables gives rise to the problem of multicollinearity. The concept of multicollinearity has been defined and described by multiple writers using different approaches. According to Gujarati and Porter (2009), the condition of collinearity arises when the correlation coefficient exceeds the threshold of 0.80 or 0.90. The value of 0.7 was suggested by Tabachnick et al. (2013). The correlation matrix presented in Table 2 demonstrates that all coefficients observed are below 0.5. Drawing on the definition provided by Tabachnick et al. (2013), there is no significant presence or severity of multicollinearity between the independent variable and control variables.

Table 2 Correlation Matrix

	ROA	**ROE**	**BC**	**BS**	**BI**	**BE**	**FS**	**FA**	**LEV**
ROA	1	-	-	-	-	-	-		**-**
ROE	0.1590	1.0000	-	-	-	-	-		**-**

BC	0.1671	0.0964	1.0000	-	-	-	-		-
BS	0.1352	0.0861	-0.0711	1.0000	-	-	-		-
BI	0.0250	0.0363	0.0572	0.0533	1.0000	-	-		-
BE	0.0914	0.0951	-0.1920	-0.0050	-0.0450	1.0000	-		-
FS	0.0553	0.1690	0.0577	0.2092	-0.0683	-0.0528	1.0000		-
FA	-0.2514	0.3005	-0.0426	0.1154	0.4217	-0.2110	0.4241	1.0000	-
LEV	0.0102	0.0085	0.0872	-0.1686	0.0263	0.1166	-0.0791	0.0524	1.0000

Source: author's calculation (2024)

Further testing is conducted to assess multicollinearity utilizing variance inflation factors (VIF) and the inverse tolerance. Table 3 presents an overview of the results obtained from these experiments. The variance inflation factor (VIF) values exhibit a consistent pattern of being below 2, indicating a low level of multicollinearity among the predictor variables. Similarly, the tolerance values consistently exceed 0.5, suggesting a high degree of independence among the predictor variables. The observed values must fall below the VIF threshold of 10 and exceed the tolerance threshold of 0.10, indicating the absence of a multicollinearity issue (Collis & Hussey, 2014).

Table 3 VIF and Tolerance

Variable	VIF	1/VIF
BS	1.1910	0.8396
BI	1.2925	0.7737
BE	1.7952	0.5570
FS	2.3411	0.4271
FA	2.0853	0.4795
LEV	1.6217	0.6166
Mean VIF	1.7211	-

Source: author's calculation (2024)

4.2.2 Heteroscedasticity

The present study assesses the reliability of the established models by conducting a test for the existence or lack of heteroscedasticity in the working models using the methodology proposed by Breusch and Pagan (1979). Based on the findings shown in Table 4, the null hypothesis pertaining to the homoscedasticity of the fitted values of the models cannot be rejected

Table 4: Breusch and Pagan Test Results

Models	Test Value	P-Value
Model 1: ROA	0.4217	0.3341
Model 2: ROE	0.3009	0.4055

Source: author's calculation (2024)

4.2.3 Serial Correlation Tests Results

The study additionally assesses the reliability of the created models by conducting a serial correlation test, as proposed by Wooldridge (2015), to determine the presence or absence of serial correlation. Based on the findings presented in Table 5, there is insufficient evidence to reject the null hypothesis, which suggests the absence of serial correlation in the panel. The results obtained from the test indicate that the established panel data models are deemed valid.

Table 5: Wooldridge Test Results

Models	Test Value	P-Value
Model 1: ROA	0.0211	0.5621
Model 2: ROE	0.0189	0.7716

Source: author's calculation (2024)

4.3 Board Size, Board Independence, Board Expertise and Financial Performance

We test the effect of board size, board independence, and board expertise on the financial performance of listed manufacturing firms in Ghana, measured in terms of return on asset and return on equity.

4.3.1 Model 1: ROA

The results of the Hausman and regression tests on Model 1 are provided in Tables 6 and 7.

Table 6: Hausman Test For ROA

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.5810	10	0.9652

Source: author's calculation (2024)

According to the data shown in Table 6, the calculated p-value of 0.9652 exceeds the alpha value of 0.05. This finding indicates insufficient evidence to reject the null hypothesis. This suggests that the individual effects are random in nature. The random effects model is considered efficient and is selected for Model 1. The results of the cross-sectional random effects regression for Model 1 are shown in Table 7.

Table 7: Regression Results of ROA Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.2273	0.1026	2.2154	0.0412
BSIZE	-0.3285	0.2068	-1.5886	0.2064
BI	0.1030	0.0286	3.6029	0.0055
BE	0.2100	0.0523	4.0136	0.0011
FS	0.1306	0.0480	2.7233	0.0194
FA	0.3842	0.2234	1.7198	0.1302
LEV	0.0104	0.0042	2.4790	0.0337
BC	0.0246	0.0068	3.6288	0.0048
BSIZE*BC	-0.2434	0.4468	-0.5447	0.4664
BI*BC	0.1142	0.0286	3.9936	0.0036
BE*BC	0.3349	0.1196	2.7996	0.0278
R^2	0.5885			
Adjusted R^2	0.5692			
F-statistic	3.2561			
Prob(F-statistic)	0.0058			

Source: author's calculation (2024)

From Table 7, board size (BSIZE) relates negatively to return on asset, considering the coefficient of -0.3285. However, the p-value of 0.2064 implies that the effect of board size on the return on equity of listed manufacturing firms is insignificant. The implication is that the number of people serving on the boards of listed manufacturing firms has little or no evidence of affecting financial performance measured in terms of return on assets. Thus, regardless of how large or small the number of people serving on boards, the financial performance of listed manufacturing firms is unaffected. This finding contradicts H_1.

The independence of boards of listed manufacturing companies (BI) relates positively to their return on assets as a measure of financial performance. This is supported by the coefficient of 0.1030. The p-value of 0.055 also indicates that the parameter (0.1030) is significant at the 1% level because the p-value is less than the alpha value of 0.01. Regarding the extent of the effect, it can be

established that a unit increase in the independence of boards of listed manufacturing companies increases their return on assets by about 0.1030, all things being equal. This implies that board independence positively and significantly affects the return on assets of listed manufacturing companies in Ghana. Thus, enhancing the independence of the board of directors of listed manufacturing companies increases their financial performance. This finding confirms H_2.

Similarly, board expertise (BE) reports a positive relationship with the return on assets of listed manufacturing companies in Ghana, with a coefficient of 0.2100. The p-value of 0.0011 implies that the parameter (0.2100) is significant at 1% since the p-value is less than the alpha value of 0.01. The coefficient of 0.2100 also implies that a unit increase in the expertise of boards of listed manufacturing firms proportionally increases their return on assets by about 0.21, all things being equal. Thus, it can be established that the expertise of directors serving on the boards of listed manufacturing companies contributes to rising financial performance, measured in terms of return on assets. This finding supports H_3.

The sizes of listed manufacturing firms (FS) relate positively and significantly to their return on assets, looking at the coefficient of 0.1306 and p-value of 0.0194. The coefficient of 0.1306 indicates that a positive relationship exists between the size of listed manufacturing firms and their return on assets and that an increase in the size of listed manufacturing firms increases their return on assets by about 0.1306. The p-value of 0.0194 implies that the effect of firm size on return on assets is significant at the 5% level, since the p-value is less than the alpha value of 0.05. Thus, it is clear that an increase in the size of listed manufacturing firms in Ghana, measured in terms of the total value of their assets, enhances their financial performance (return on assets).

The ages of listed manufacturing firms (FA) are positively related to their return on assets, looking at the coefficient of 0.3842. However, the p-value of 0.1302 suggests that the coefficient is insignificant. Thus, there is little or no evidence that the ages of listed manufacturing firms in Ghana contribute to their return on assets.

Listed manufacturing firms' leverage (LEV) positively affects their return on assets, considering the coefficient of 0.0104. The coefficient (0.0104) is significant at the 5% level, considering the p-value of 0.0337, which is less than the alpha value of 0.05. The coefficient also implies that a unit increase in leverage increases the return on assets by approximately 0.0104. Thus, increased leverage in listed manufacturing firms increases their return on assets in Ghana.

The R^2 of 0.5885 implies that the independent variables account for approximately 58.85% of the variation in listed manufacturing firms' return on assets. The adjusted R^2 of 0.5692 also implies that the introduction of any additional independent variables accounts for approximately 56.92% of the variation in return on assets. The F-statistic is 3.2561, and the prob (F-statistic) is 0.0058 (less than 0.01), implying that the overall results are significant.

4.3.2 Model 2: Return on Equity

We further test the effect of board size, board independence, and board expertise on the return on equity of listed manufacturing firms in Ghana. The results of the Hausman and regression tests are provided in Tables 8 and 9.

Table 8: Hausman Test for Board Effects On ROE

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.7710	10	0.9423

Source: author's calculation (2024)

The null hypothesis that the individual effects are random is accepted because the p-value in Table 8 is higher than the level of significance of 0.05. As a result, Model 2 makes use of the random effect. Table 9 displays the outcomes of the cross-sectional random-effect regression.

Table 9: Regression Results of ROE Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.3210	0.1325	2.4230	0.0199
BSIZE	-0.1889	0.4241	-0.4454	0.6584

BI	0.0478	0.0119	4.0168	0.0003
BE	0.3349	0.1196	2.7996	0.0078
FS	0.1258	0.0481	2.6185	0.0122
FA	0.3561	0.1667	2.1358	0.0366
LEV	-0.1124	0.1533	-0.7332	0.8237
BC	0.0245	0.0064	3.7999	0.0005
BSIZE*BC	0.1002	0.0461	2.1737	0.0354
BI*BC	0.1306	0.0480	2.7233	0.0094
BE*BC	0.3652	0.1135	3.2164	0.0025
R^2	0.6491			
Adjusted R^2	0.5416			
F-statistic	4.1777			
Prob (F-statistics)	0.0001			

Source: author's calculation (2024)

When the coefficient of -0.1889 is taken into consideration, it can be shown that board size (BSIZE) has a negative relationship with return on asset. However, the fact that the p-value for the effect of board size on the return on equity of listed manufacturing companies is 0.6584 suggests that this effect is not significant. This indicates that there is either a limited amount of evidence or none at all, suggesting that the number of individuals serving on the boards of publicly traded manufacturing companies has an effect on the return on equity of those companies. In light of this, the return on equity (ROE) of publicly traded manufacturing companies is unaffected by the size of the number of individuals serving on boards, regardless of how large or small the number may be. This observation runs counter to H_1.

There is a significant relationship between the independence of boards of directors of publicly traded manufacturing firms in Ghana and the return on equity of those companies. A coefficient of 0.0478 lends credence to this perspective. According to the p-value of 0.0003, the parameter (0.0478) is significant at the 1% level. This is because the p-value is lower than the alpha value of 0.01, which is the threshold for statistical significance. When it comes to the magnitude of the effect, it is possible to demonstrate that a one-unit increase in the independence of boards of directors of publicly traded manufacturing businesses generates a return on equity that is approximately 0.100.0478 times higher, all things being equal. It is possible to prove that the return on equity of listed manufacturing businesses in Ghana is favorably and significantly affected by the independence of the board of directors governing those companies. Therefore, a rise in the degree to which the board of directors of publicly traded manufacturing businesses is independent leads to an increase in the return on equity of those companies. As a result, H_2 is acceptable.

In a similar vein, board expertise (BE) reports a coefficient of 0.3349, implying a positive link with the return on equity of listed manufacturing companies in Ghana. Since the p-value is lower than the alpha value of 0.01, the parameter (0.3349) is considered significant at the 1% level, as indicated by the p-value of 0.0078. The coefficient of 0.3349 also suggests that a unit increase in the expertise of the boards of directors of selected manufacturing companies results in a proportionate rise of around 0.3349 in the return on equity. As a result, it is possible to show that the expertise of directors serving on the boards of publicly traded manufacturing firms in Ghana helps improve financial performance (return on equity). Thus, H_3 is validated.

After examining the coefficient of 0.1306 and the p-value of 0.0194, it can be determined that there is a positive and significant relationship between the sizes of listed manufacturing businesses (FS) and their return on equity. A positive link exists, looking at the coefficient of 0.1306, which also implies that an increase in the size of listed manufacturing firms results in an increase in their return on equity of around 0.1306. The fact that the p-value is lower than the alpha value of 0.05 indicates that the influence of company size on return on equity is significant at the 5% level. In light of this, it is evident that growth in the size of listed manufacturing businesses in Ghana leads to an improvement in the financial performance of those firms.

When looking at the coefficient of 0.3561, it can be seen that there is a positive relationship between the age of listed manufacturing businesses (FA) and their return on equity. The p-value of 0.0366 indicates that the coefficient meets the criteria for significance at the 5% level. In light of this, it is clear that the ages of manufacturing companies listed in Ghana provide a favorable and significant boost to their return on equity. The result is that the financial performance of listed manufacturing businesses in Ghana tends to improve as these firms continue to function over the years.

When the coefficient of -0.1124 is considered, the leverage (LEV) of listed manufacturing companies has a negative impact on their return on equity. Having said that, this coefficient (-0.1124) is not significant when taking into account the p-value of 0.8237, which

is higher than the alpha value of 0.10. Therefore, there is either very little or no evidence to suggest that leverage plays a role in the return on equity of listed manufacturing businesses in Ghana.

The coefficient of determination (R^2) of 0.6491 indicates that the independent variables are responsible for about 64.91 % of the variation in the financial performance (return on equity) of listed manufacturing companies. It can also be deduced from the adjusted R^2 value of 0.5416 that the addition of a new independent variable is responsible for about 54.16% of the variance in return on equity. The F-statistic is 4.1777, and the probability (F-statistic) is 0.0001, which is lower than the threshold of 0.01. It can be drawn from this that the overall outcome is significant.

4.4 Moderating Role of Board Commitment

From Table 7, the interacting variable (BSIZE*BC) has a coefficient of -0.2434, implying that board commitment (BC) negatively moderates how board size relates to listed manufacturing firms' return on assets. However, looking at the p-value of 0.4664, it can be established that the moderating effect is insignificant since the p-value of 0.4664 is greater than the alpha value of 0.10. Thus, evidence is insufficient to suggest that board commitment negatively moderates the relationship between board size and return on equity. Thus, irrespective of the commitment of board members serving on the boards of listed manufacturing companies in Ghana, the effect of board size on financial performance (return on assets) does not change.

It is also clear from Table 7 that the coefficient of the interacting variable (BI*BC) is 0.1142, and the associated p-value is 0.0036. This is an indication that the commitment of board members of listed manufacturing companies positively and significantly affects the relationship between board independence and return on assets. This is supported by the p-value (0.0036), which is less than the alpha value of 0.05. The commitment of board members of listed manufacturing companies in Ghana strengthens the positive effect of board commitment on their return on assets.

Similarly, Table 7 depicts that the interacting variable (BE*BC) has a coefficient of 0.3349 associated with a p-value of 0.0278. The coefficient is significant at the 5% level because the p-value is less than the alpha value of 0.05. The implication is that commitment on the part of the board of directors of listed manufacturing companies strengthens the positive effect of board expertise on the financial performance (ROA) of these firms. Thus, through the commitment of the board of directors, their expertise is better able to influence their companies' financial performance.

Looking at Table 9, the interacting variable (BSIZE*BC) reports a coefficient of 0.1002 and a p-value of 0.0354, implying that board commitment positively and significantly moderates the relationship between board size and return on equity of listed manufacturing companies in Ghana. Thus, commitment on the part of directors serving on the boards of listed manufacturing companies strengthens the effect of board size on financial performance. H4a, which establishes that board commitment positively and significantly moderates the link between board size and financial performance (ROE), is accepted.

Table 9 also shows that the interacting variable (BI*BC) records a coefficient of 0.1306 and a p-value of 0.0094. The positivity of the coefficient and the p-value being less than 0.01 implies that board commitment positively and significantly moderates the relationship between board independence and the return on equity of listed manufacturing companies in Ghana. Thus, through the commitment of the board of directors, the positive effect of their independence on the financial performance of companies becomes stronger. Based on these findings, H4b is confirmed.

The coefficient of board commitment as a moderating variable in the effect of board expertise on listed manufacturing companies' return on equity is 0.3652, as presented in Table 9. This coefficient is significant at the 1% level as the associated p-value (0.0025) is less than 0.01. H4c, which stipulates that board commitment positively and significantly moderates the link between board expertise and financial performance (ROE) of listed manufacturing companies, is confirmed. This implies that the commitment of the board of directors matters in terms of how their expertise relates to the financial performance of listed manufacturing companies in Ghana. This is the case because the commitment of the board of directors strengthens the positive effect of board expertise on financial performance.

4.5 Discussion of Findings

From Tables 7 and 9, it is evident that board size does not affect the financial performance of listed manufacturing companies in Ghana. It is also justified that the independence and expertise of the board of directors improve the financial performance of listed manufacturing companies in Ghana. The findings regarding board size contradict those of Onware et al. (2020), Abdallah and Turksoy (2023), and Kyere and Ausloos (2020), detailing that larger boards tend to exhibit dysfunctional characteristics that negatively affect financial performance. This is mostly attributed to the increased complexity of reaching agreements, which arises

from the presence of different issues. These findings also contradict those of Singla and Singh (2019), Sethi et al. (2023), and Gurasamy (2017), indicating that larger board sizes bring about improved financial performance.

The findings on board independence are commensurate with those of Ofoeda (2017), Mensah and Beizi (2023), and Fernandez-Gago et al. (2016), who establish that the independence of board members brings about better financial performance. Our findings on board expertise are consistent with those of Amjarayah et al. (2023), Marinova et al. (2016), and Hillman and Dalziel (2003), who found that individual talents and knowledge possessed by board members increase financial performance. However, this finding contradicts those of VanNess et al. (2010), Sidki et al. (2023), and Andoh et al. (2023), pointing to a negative relationship between board expertise and financial performance. The findings on board independence and board expertise are substantiated by the stakeholder and resource dependency theory emphasized in this study. For better roles of board independence and board expertise on financial performance, the stakeholder theory suggests that management should prioritize building and maintaining connections with all stakeholders rather than only concentrating on shareholders, as explained by Jensen (2001). This theory establishes a connection between corporate governance and financial performance by highlighting the importance of generating value for all stakeholders to generate value for investors. According to resource dependency theory, the composition of a manufacturing company's board in terms of the number of members, the ratio of non-executive directors, and their qualifications in education, profession, and financial knowledge is crucial for assessing the human resources available. These human resources provide an opportunity for improved financial results. Adding key resources to the board of directors strategically helps reduce reliance and improves a firm's financial performance.

The findings from Tables 7 and 9 also imply that the effect of board size, board independence, and board expertise on the financial performance of listed manufacturing companies can be strengthened through the level of commitment displayed by board members. This is in line with the argument put forth by Ejike (2020) that board commitment enhances the probability of effectively tackling a wide range of challenges that may threaten a firm and impede its performance. Drawing on this, we argue that issues pertaining to board size, independence, and expertise may be addressed by the commitment displayed by the board of directors. This enhances the effects of board size, independence, and expertise on the financial performance of listed manufacturing companies in Ghana.

5. Conclusions and Recommendations

5.1 Conclusion

The notion of corporate governance emphasizes the need to provide investors with timely and correct information regarding the company. Additionally, corporate governance demonstrates that manufacturing companies are obligated to disclose all information regarding their financial conditions in a manner that is truthful, presentable, and transparent. Using a panel regression approach, the first research question focused on the effect of board size, board independence, and board expertise on the financial performance of listed manufacturing firms in Ghana. The second research question focused on the moderation function of board commitment. It can be deduced from the findings that the independence and expertise of members serving on the boards of listed manufacturing firms play a critical role by way of increasing the financial performance of such firms. It can also be deduced that through the commitment of the board of directors of listed manufacturing firms, the size, independence and expertise of the board of directors can be employed to further increase the financial performance of their manufacturing companies. Thus, board commitment plays a crucial role in how board size, independence and expertise relate to the financial performance of listed manufacturing firms in Ghana.

5.2 Limitation and Further Research

The study focused on only listed manufacturing companies in Ghana, which restricted the sample size. The sample size could have been larger if the study had been extended to manufacturing firms or other sectors of the economy. To enhance generalization, it is recommended that future studies be extended to include listed and non-listed manufacturing firms in Ghana. Future studies can also be extended to other sectors of the economy. The study also measured financial performance in terms of return on assets and return on equity. We recommend that future studies focus on other proxies of financial performance to confirm the findings of this study. Future studies can also consider other corporate governance measures such as board diversity, CEO duality, board composition, board committees, and board compensation, among others.

5.3 Recommendations for Policy and Practice

The study found that board independence and board expertise improve the financial performance of listed manufacturing firms in Ghana. In line with this, a board must be fully aware of the skills it possesses and the ones it still lacks in order to function effectively. A good board should have a good balance of directors with expertise and knowledge of the company and newcomers who could offer a different perspective. Directors' behavioral competences, which are additional qualities they possess, should be taken into consideration when evaluating them because they will impact relationships within boards, between boards and management, and between directors and significant stakeholders.

In order to achieve effectiveness, it is imperative for boards to include measures within their structures and nominating procedures to prevent insiders and executive owners from exerting excessive influence over the board's activities and decision-making processes. It is recommended that company boards have a majority of independent members. A board with a majority of independent members is more inclined to prioritize the best interests of shareholders. This will promote autonomous decision-making and alleviate potential conflicts of interest that may emerge.

Board commitment plays a critical role in strengthening the effect of board size, independence, and expertise on the financial performance of listed manufacturing companies. We recommend that boards of directors be aware of their own strengths and weaknesses if they are to manage effectively. Only if the entire board and each director are routinely evaluated can board commitment be assessed. Therefore, there should be a strong policy guide to assess the commitment of the board of directors occasionally. An assessment of the commitment of the board of directors may be beneficial for boardroom interactions, board procedures, board decisions, and the overall performance of the board, which will bring about improved financial performance. Any agreed-upon measures must be carried out and monitored after an assessment. In order to remedy the shortcomings identified in board assessments, management and directors should consider enhancing their governance practices via director development programs.

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