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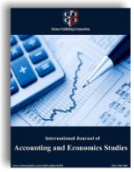


The impact of capital adequacy and corporate governance on financial performance of universal banks in Ghana

Richard Akentara [1] *, Isaac Appiah Amankwa [2], William Awuma [3]

[1] Department of Accounting and Finance Faculty of Economics and Business Administration Catholic University of Ghana
[2] Isaac Appiah Amankwa Department of Economics Faculty of Economics and Business Administration Catholic University of Ghana
[3] William Awuma Department of Economics Faculty of Economics and Business Administration Catholic University of Ghana
**Corresponding author E-mail: Richard.akentarah@cug.edu.gh*

Abstract

The study seeks to determine the influence of capital adequacy ratio (CAR) and corporate governance attributes on financial performance of listed universal banks in Ghana. The authors sampled five banks from a population of nine banks listed on the Ghana Stock Exchange (GSE) using a simple random sampling method. The study employed quantitative design and procedures using secondary quarterly data from annual financial statements published from 2012 to 2022. The data was analysed using the fixed-effects regression model with Stata (ver. 17). The findings indicate that some universal banks have board sizes less than 13, which is at variance with the number required by the Corporate Governance Guidelines (CGGs) of the Bank of Ghana (BoG). Again, CAR, bank size, monetary policy rate, and inflation rate have a statistically significant impact on return on assets, while board size, board of directors (BoD) independence, GDP, and non-performance loan ratio have an insignificant influence on the financial performance of listed universal banks in Ghana. The study recommends that the management of universal banks listed on the GSE should seriously consider the BoG's CGGs and suggests that the BoD should not have less than 13 members. The study recommends that universal banks adhere to the required CAR from the Central bank religiously. Again, universal banks should open more branches in all district capital to ensure they mobilize liquidity from those with surplus funds to boost the availability of loanable funds for businesses to borrow for their operations. The study also recommends that more research be conducted to determine the optimal number of directors on the board to ensure the optimal performance of universal banks in Ghana.

Keywords: *Capital Adequacy Ratio; Return on Assets; Board Independence; Bank Size; Board Size.*

1. Introduction

The separation of ownership and management in the principal-agent relationship brought about corporate governance (Marios, 2023). Corporate governance is a system under which entities are controlled and directed. Senior management and non-executive directors oversee corporate governance, and the board of Directors is responsible for directing and controlling the entity's corporate strategy and putting in place systems, rules, and regulations to govern the smooth running of an entity (Pandey, Andres & Kumar, 2023). Their major role is to define the corporate goals and long-term strategy of the entity. Since management and shareholders' interests are different, directors and management are interested in higher remunerations, while shareholders' interest is higher return on their investment (Nashier & Gupta, 2023).

The non-executive directors are appointed by shareholders to ensure that senior managers' and shareholders interest are aligned. One way of ensuring that shareholders' interests are aligned with senior managers' interests is that remunerations are based on performance and that mechanisms are in place to ensure shareholders' value is created and maximized (Kakabadse, Yang & Sanders, 2010). There is the need therefore, to study the influence of board characteristics and capital adequacy on the financial performance of universal banks following the banking clean-up exercise in Ghana.

Bank of Ghana conducted a financial sector clean-up in 2017 to create an enabling environment for the financial sector to grow and contribute to financial inclusiveness, economic development, and poverty reduction. The regulatory framework of banking supervision before then, failed to address poor business practices, inadequate operating capital position, and corporate governance issues in the banking sector culminating to the banking crisis in Ghana prior to 2016 (Amenu-Tekaa, 2022). The main objective of the clean-up exercise was to pursue a sound monetary policy aimed at price stability and creating an enabling environment for sustainable economic growth. Most banks recorded high levels of non-performance loans that affected their liquidity, thereby reducing access to credit by medium and small business enterprises (Adane, 2022). Some of the causes of the banking crises in Ghana according to Kim Quoc Trung (2022) included poor lending practices, excessive risk-taking, regulation and oversight ineffectiveness and external shocks created by COVID-19 pandemic.

One of the main causes of the non-performance of Ghanaian banking financial institutions at the time was inadequate liquidity influenced by the loss of confidence of the public sector (Al-Ardah & Al-Okdeh, 2022) resulting in panic withdrawals by customers of universal banks after hearing that financial institutions were facing liquidity challenges (Sandri et al., 2023). It was discovered that most financial

institutions were relying on customers' deposits to finance working capital as a result of inadequate capital available for day-to-day operations (Ofori, 2023).
Although there are studies on corporate governance and financial performance of universal banks in Ghana, their focus did not include capital adequacy as a determinant of bank performance. This is because adequacy of banks' capital serves as a cushion or insurance against bank failure and also makes the investment of bank owners (shareholders) safer reducing the risk of bankruptcy (Mishkin, 2019). Secondly, capital adequacy and financial performance have not been studied much in Ghana, hence, creating a literature gap which this study intends to fill. This study therefore seeks to examine the impact of capital adequacy and corporate governance attributes on financial performance of listed commercial banks in Ghana.

2. Literature review

This paper employs the agency theory, the resource dependency theory, and the stakeholder theory to explain the link between capital adequacy ratio (CAR) of banks, corporate governance attributes and return on assets (ROA) of universal banks in Ghana (Morekwa-Nyamongo & Temesgen, 2013). These theories are widely used as relevant theories in studies on finance and accounting. The use of the agency theory is premised on the fact that governance stems from the separation of ownership and management of companies resulting into an agency problem (Bosse & Phillips, 2016). On the other hand, the stakeholder theory supports the notion that in every business establishment, there are different stakeholders with different interest in corporate affairs which can result in conflict between participants in the management of corporate resources (Wicks et al., 2023). In situations where the same person occupies dual positions, there is the likelihood that monitoring role of the board may be sidelined leading to negative impact on the financial performance (Owiredu & Kwakye, 2020). This study also looks at the possibility of diminishing board independence resulting from the dual position of the CEO.

2.1. Conceptual review

The conceptual review links the independent variables (CAR, and the vector of board characteristics) to the dependent variable financial performance. The relationship between CAR and financial performance is reviewed and the influence of vector of board characteristics on financial performance is also reviewed.

2.2. Capital adequacy and financial performance

According to Ayadi, Ayadi and Trabelis (2019) insider arrangement and capital monitoring mechanisms have profound effects on financial performance commercial banks. The experiences of bankers, academia and industry practitioners indicate that capital adequacy ratio has less influence on financial performance of financial institutions as a result of the variations in fair-value-based structure inherited from old cost-based bookkeeping structure (Martins et al., 2022). The work of Sahyouni and Wang (2019) and El-Chaarani et al. (2023) discovered that there is no substantial impact between liquidity formation and return on assets of commercial banks in Africa. Similar study in Tunisia and Morocco banking sector showed a positive effect between capitalization and efficiency while bank capital adequacy and gross domestic products (GDP) have negative impact on efficiency (Kallel et al., 2019; Bhattarai, 2021).
The outcome of studies showed that Tier 1 CAR has significant potential to reduce risks in the banking business (Syafrizal et al., 2023). CAR has an inverse relationship with bank risk (Asiamah et al., 2023). A study carried out by Shirya et al. (2023) capital requirement of central bank has positive and significant influence on financial performance of commercial banks in Nigeria. The review above shows that the adequacy of capital reduces risk and for that matter likely to influence financial performance positively.

2.3. Board characteristics and financial performance

Examining the relationship between board characteristics and financial performance, Abubakar et al. (2023) discovered that board meeting, board gender diversity and board independence have insignificant effects on financial performance of commercial banks in Nigeria. However, the study indicated a significant positive influence between board size and financial performance.
Another study investigated the controlling outcome of Shariah Committee quality on the nexus between board effectiveness and performance of Islamic banks in Malysia and the outcome showed a positive association between board effectiveness and financial performance of commercial banks (Eldaia et al., 2023). The strengths and weaknesses of Shariah board was studied by Haddad and Souissi (2022) and the results showed emphatically shariah board size, number of board meetings and application of the shariah impacted positively on the performance of Islamic banks.
Having explored the influence of board attributes on financial performance in Nigeria, Okolie and Uwejeyan (2022) found a significant influence between board meeting and financial performance. Again, another study investigated the impact of the attributes of audit committee on performance and the results showed a significant positive relationship between audit committee independence and financial performance in Saudi Arabia. Another related study is the work of Boukattaya et al. (2022) which investigated the moderating role of corporate social practices on board gender diversity and financial performance, and they found that corporate social practices have a strong asymmetric influence on financial performance. The above review is a clear manifestation of the influence board characteristics have on banks performance.

2.4. Empirical review

The liberalization of Ghana's financial system has included the relaxation of interest rate controls, a credit ceiling, partial privatization of the government's banks, restructuring of public sector banks, capital market developments, and deregulation of the prudential system (Elghonemey, 2023). In the 1960s and early 1980s, the lack of adequate regulatory enforcement and regular supervision of commercial banks (Nyebar et al., 2023) was one of the major causes of the financial sector's underperformance. Little was done to ensure that adequate provision of reserve and capital requirements was met by various financial institutions (Kwashie et al., 2022). Large sums of non-performing assets were discovered in the books of financial institutions in the 1970s and 1980s, respectively, leading to the financial insolvency of most of the banks in Ghana (Torku & Laryea, 2021). An excellent corporate authority application gives investors self-assurance and guards the resources they put into the company (Hasan & Mildawati, 2020). The financial output of the company can be used to judge management's success in using resources (Masitha, 2019). The size of the value of shareholding in the company determines the prosperity of the

outcome in the value of the business, and this is the direct reflection of the financial performance reported in the company's success (Wahyuni et al., 2022)

The work of Affes and Jarboui (2023) concluded that corporate governance contributes positively to firms' financial performance. Chiaramonte and Casu (2017) examine the effectiveness of capital adequacy measures in predicting banks' distress and found that non-risk-weighted capital adequacy measures and the adjusted leverage ratio explain a bank's financial distress and failure. They further suggested that capital adequacy and earnings contribute to firms' financial performance. Fidanoski, Mateska, and Simeonovski (2014) researched corporate governance and bank performance using return on assets (ROA), return on equity (ROE), cost-income ratio (CIR), and capital adequacy ratio (CAR) and found that board of directors' characteristics have a positive relationship on banks' profitability. The work of (Boukattaya et al. (2022) showed a positive association between board meeting frequency and firm performance of commercial banks. The independence of the board of directors, measured as the ratio of non-executive directors to the total number of directors on the board, has been studied extensively in business authority studies. These studies proved that a developed number of non-executive directors on the board is required to ensure the entire board's freedom and expand the board's regulatory capabilities (Musah et al., 2019). The main advantage of the independence of directors has been the protection of the interest of marginal holding and upholding equality (Meindarto & Lukiastuti, 2017). The number and quality of independent non-executive directors on the board are considered to safeguard the interests of minority shareholders (Hidayat et al., 2021).

Several studies have shown that corporate governance attributes positively impact financial performance (Sarpong-Danquah et al., 2022; Kiptoo et al. 2021). Sound corporate governance practices improve the firm's value and increase financial performance, lower the risk of board decisions to their advantage, and increase the confidence of clients and potential investors (Omagwa & Muathe, 2019). The work of Alfisah and Zulfikar (2022) discovered that attributes of the board of directors touch the value of a company positively, and the independence of directors has a positive impact on corporate development and the market value of firms (Afiani & Bernawati, 2019). The work of Masitha (2019) examined the effect of corporate governance on firm value creation and found that the existence of a board of directors has a significant negative impact on intellectual resources and a positive impact on firms' corporate social responsibility. The unpredictable findings in the literature encourage people to conduct further research into corporate governance, attributes of boards, their interrelationships, and corporate financial performances. Ramadhan et al. (2022) found that board size, board meetings, and corporate ownership positively impact organizational value, while board committees with ownership concentration do not affect the company's value.

The corporate governance attributes can be used to examine critical financial performance indicators in a company's activities. The board meetings, board composition, board independence, and the number of female directors all reflect the company's funding structure from outsiders (Ngatno et al., 2021). The diversity of the board is another crucial determinant of board functionality, and it entices much consideration in the research in developed countries (Ahmed et al., 2023). Some other studies indicate no substantial association between chief executive officer and board chair duality and financial performance (Alves, 2023). The relationship between gender diversity and financial performance has been mixed and inconclusive (Musah et al., 2019). The specific number of directors on the firm's board is considered a critical indicator of good corporate governance (Gyamerah et al., 2020; Gupta & Chauhan, 2023). While some studies consider a small number to minimize social loafing and free riding, others believe that large numbers of the board are essential for cross-fermentation of ideas (Musah et al., 2019). Sidki et al. (2023) found a positive impact of board size on financial performance in developed countries while revealing that board size decreases firm performance (Le et al., 2023).

Simiyu (2015) employed panel data and fixed effect analysis to investigate the impact of macroeconomic variables on the profitability of listed commercial banks on the Nairobi Securities Exchange (NSE). The result showed that exchange, GDP, and interest rates do not significantly influence bank performance. Similarly, Kanwal and Nadeem (2013) and Evans and Kiganda (2014) showed, using evidence from the OLS approach, that inflation, GDP, and exchange rates did not significantly influence bank profitability in Pakistan and Kenya, respectively. Other studies had contrary outcomes. For instance, in Namibia, Sheefeeni (2015) found the contrary that macroeconomic variables significantly influence bank performance. Likewise, inflation, GDP growth, and real effective exchange rate significantly impacted bank profitability in Togo (Combey & Togbenou, 2017). A study by Olokoyo et al. (2021) employs an autoregressive-distributive lag (ARDL) test approach to co-integration analysis to examine how macroeconomic factors affect bank performance. They found that while growth and trade promote bank performance, a high-interest rate impedes bank performance. Also, inflation had a positive but insignificant impact on bank performance. Hence, there is a contradiction in the findings of these studies in developed countries. What is the situation in developing countries like Ghana? It is based on the forgone debate of inconclusiveness. In line with modern concepts of good corporate authority, examining the influence of corporate governance attributes and the financial performance of universal banks in Ghana is essential.

3. Materials and methods

This study examines the relationship between the capital adequacy ratio (CAR), board characteristics, and financial performance of listed banks in Ghana. The study employs longitudinal time measurement using panel data. In this approach, researchers observe the same selected listed banks across multiple time points (Evered & Roger, 2022). This paper employed a quantitative study design for many purposes. First, it analyzes the impact of CAR and corporate governance attributes on the financial performance of universal banks in Ghana. It is considered the appropriate methodology to achieve the study's objectives. Furthermore, this study made use of secondary data gathered from the financial reports of the selected banks, which are quantities and numbers in nature and therefore appropriate to use quantitative design for the analysis, as done in the work of Musah and Adutwumwaa (2021).

All listed banks in Ghana were the target population, a sample of which was examined in terms of their capital adequacy ratios and corporate governance characteristics from 2012 to 2022. This implies that the population of the study was made up of all nine listed universal banks in Ghana. However, listed banks that report their financial statements in foreign currencies were excluded from the population because there was no time to translate foreign exchange before using the data.

This paper employed simple random sampling to select five (5) banks out of the nine listed banks in Ghana. Simple random sampling is necessary because it gives each member of the population an equal chance of being selected to be part of the study (Gupta & Gupta, 2022). The data was sourced from the published financial statements of the five selected listed banks in Ghana. The five selected listed banks included Ghana Commercial Bank (GCB), Agriculture Development Bank (ADB), Cal Bank, Standard Chartered Bank, and Republic Bank.

This is purely quantitative research in which secondary data were collected from the published financial statements of the selected banks in Ghana, covering ten years (from 2012 to 2022). The financial performance indicator used in this study is the return on assets (ROA) as

a dependent variable. In contrast, capital adequacy ratio (CAR) and corporate governance indicators include board size (BDSIZE), board independence (BIND), and bank size in terms of total assets (BSIZE), as used by Owiredu and Kwakye (2020).

Table 1: Variable Measurements, Type and Sources

Variables	Measurement	Type of variable	Source
Return on Assets (ROA)	Profit after tax divided by total assets	Dependent variable	Abubakar, Yahaya & Joshua (2023)
Capital Adequacy Ratio (CAR)	Tier 1 capital plus Tier 2 capital divided by risk-weighted assets	Independent variable	Martins, Sá & Taborda (2022)
Board size (BDSIZE)	Number of directors on the board	Independent variable	Eldaia, Hanefah & Marzuki (2023
Board Independence (BDIND)	Number of independent directors as a ratio of total board number	Independent variable	Kwashie, Baidoo & Ayesu (2022)
Bank size (BSIZE)	The ratio of Tier 1 capital to total risk-weighted assets	Independent variable	Abubakar, Yahaya & Joshua (2023)
Inflation rate (INFL)	Headline Inflation Year-on-Year	Control variable	Bank of Ghana (2023)
Real Growth Rate in GDP (RGR)	Bank of Ghana Composite Index of Economic Activity (Real Growth)	Control variable	Bank of Ghana (2023)
Non-performing Loan Ratio (NPLR)	Non-Performing Loans	Control variable	Bank of Ghana (2023)
Monetary Policy Rate (MPR)	Monetary Policy Rate (%)	Control variable	Bank of Ghana (2023)

Source: Field data, 2023

3.1. Model specification

To determine the relationship between capital adequacy, corporate governance indices and financial performance, this study formulates mathematically the model in the form below:

$$Y_{it} = f(CAR_{it}, X_{it}, C_{it}) \quad (1)$$

Where:
Y_{it} = the financial performance of the selected listed banks i in time t
X_{it} = a measure representing board characteristic of selected listed banks i in time t
CAR_{it} = Capital adequacy ratio of selected listed banks i in time t
C_{it} = a set of control variables of selected listed banks i in time t
In specific terms the model above is restated as follows:

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 BDSIZE_{it} + \beta_3 BIND_{it} + \beta_4 BSIZE_{it} + \beta_5 INF_{it} + \beta_6 RGR_{it} + \beta_7 NPLR_{it} + \beta_8 MPR_{it} + \mu_{it} \quad (2)$$

Where:
ROA = Return on Assets of the selected listed banks [for i and t] in Ghana
CAR = Capital Adequacy Ratio of the selected listed banks in Ghana
BDSIZE = Board size of the selected listed banks in Ghana
BIND = Board independence of the selected listed banks in Ghana
BSIZE = Bank size of the selected listed banks in Ghana.
β_0 = Intercept
$\beta_1 - \beta_8$ = Coefficients of board characteristics, capital adequacy ratio, and control variables.
μ = Error term

3.2. Estimation methods: fixed, random effects estimations and the pooled OLS models

Panel data refers to a dataset that records the behaviours of entities over time. The goal is to account for variables that cannot be observed or measured across entities or that change over time but not across entities. The individual characteristics of these entities may or may not affect the outcome or predictor variables. Since the unique characteristics are not random and may influence the predictor or outcome variables, we need to control for them. Fixed effects (FE) remove the effects of such time-invariant characteristics so we can assess the net impact of the independent variables on the dependent variable. It assumes a correlation between the entity's error term and predictor variables. The random effects (RE) estimation assumes the opposite (Torres-Reyna, 2007). Therefore, the RE model assumes that the variation across entities is random and uncorrelated with the predictor or independent variables included in the model, unlike the FE model. Hence, the two estimation approaches differ. The model specification in (1) represents the FE and (2) the RE models.

$$Y_{it} = \alpha_i + \beta_k X_{it} + e_i \quad (3)$$

$$Y_{it} = \alpha_i + \beta_k X_{it} + \mu_i + e_i \quad (4)$$

Where, i = listed bank and t = time (from 2012 to 2022).
Y_{it} is the ROA (for bank i at time t).
αi (i = 1, …, n) is the unknown intercept for each bank (bank-specific intercept).
X_{it} is a vector of predictors (for bank and control variables i at time t).
β_k is the coefficient for respective independent and control variables.
μ_i is the individual impact of i^{th} bank, not measurable variables.
e_{it} is the error term.
The choice of model for panel data analysis requires conducting the Hausman or Durbin-Wu-Hausman (DWH) test. If the test results indicate a significant coefficient difference, then the FE model is used; otherwise, the RE model is preferred (Torres-Reyna, 2007). In addition, if the DWH test opts for the RE model, the Lagrange multiplier (LM) test is used to decide if the RE model or the pooled OLS

model is suitable for the data. The null hypothesis variance across entities is zero. Specifically, if the LM test indicates the presence of random effects, the RE model will be chosen otherwise the pooled OLS model OLS will be the final decision (Dougherty, 2011).
The Pooled OLS Model is specified in (3) as follows:

$$Y = \alpha + \beta_i X_i + e \quad (3)$$

Y is the outcome variable [ROA].
α is the intercept.
X_i is a vector of predictors and control variables.
β_i is the coefficient for respective independent and control variables.
e is the error term.

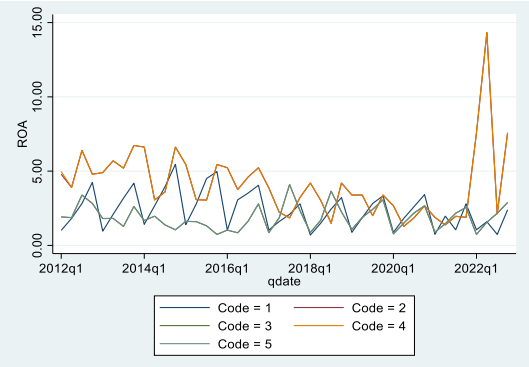
4. Results and discussion

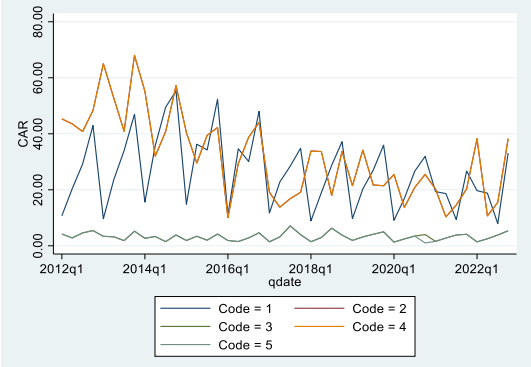
This section presents the results of the data analysis. It involves both descriptive and inferential statistical analysis, as well as post-estimation tests. The results are organized into tables and then presented with written explanations. The descriptive statistics for this study are provided in table 4.1 below:

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std Dev.	Min	Max
Return on Asset (ROA)	220	2.881	1.948	0.700	14.320
Capital Adequacy Ratio (CAR)	220	19.341	17.255	1.010	68.020
Board Size (BDSIZE)	220	10.395	2.659	7.000	15.000
Board Independence (BDIND)	220	0.658	0.0875	0.530	0.850
Bank Size (BSIZE)	220	7.456	4.854	1.220	25.480
Inflation Rate (INFL)	220	13.921	7.294	7.800	48.267
Real Growth Rate (RGR)	220	9.605	15.151	-5.523	62.513
Non-Performing Loan Ratio (NPLR)	220	15.841	3.182	11.310	22.927
Monetary Policy Rate (MPR)	220	18.424	4.090	13.167	26.167

The descriptive statistics for the dependent variable (ROA) showed a mean score of (M = 2.88, SD = 1.95), while the independent variables scored mean values of capital adequacy ratio (CAR) (M = 19.34: SD = 1.01); board size (BDSIZE) (M = 10.39: SD = 2.66); board independence (BDIND) (M = 0.65: SD = 0.087); and bank size (M = 7.45: SD = 4.85). The descriptive data suggests that Ghana's banking sector's average return on assets ratio is about 2.88, while the capital adequacy ratio also approximates 19.34. This implies that the financial performance ratio of universal banks in Ghana as a percentage of their total assets is less than 3%. Meanwhile, the capital required to operate as a percentage of their risk-weighted assets is almost 20%, depending on the size of the bank. In the case of the board size, the statistics indicate that the average size of the board of directors of the sampled banks is more significant than 10. Considering the critical functions of the board, does it matter to have a mean size of the board as large as ten individuals? The mean statistics of board independence and bank size of 0.66 and a standard deviation of 0.087 and 7.45 with a standard deviation of 4.85 are consistent with Bhattarai (2021), who measured the impact of capital adequacy ratio on the financial performance of commercial banks in Nepal and found similar results. The outcome of the descriptive data clearly showed that the average values were higher than their standard deviation, suggesting a higher variability in the sizes of these banks.
Regarding the control variables, the descriptive statistics are inflation rate (M = 13.92, SD = 7.29), index of economic activity (Real Growth Rate) (M = 9.61, SD = 15.15), non-performing loans (M = 15.84, SD = 3.18), and monetary policy rate (M = 18.42, SD = 4.09). The quarterly inflation rate over the period is 13.92%, which falls outside the Bank of Ghana's (BoG) inflation target, usually between 6% and 10%. In terms of growth rates in economic activities, the performance over the period under consideration has been quite impressive, with an average real rate of 9.61%. However, the standard deviation figure of 15.15% suggests considerable variations in growth. The issue of non-performing loans has become a monster for the banking industry. It was one of the reasons the clean-up of the financial sector was initiated in 2017 (Adane, 2022). The average non-performing loan rate is 15.84%, ranging between 11.31% and 22.93%. These figures are still high for the sound performance of the financial sector and for generating enough liquidity to support the real sector of the economy. To keep the money supply and inflation in the economy within target, the BoG adjusts its Monetary Policy Rate (MPR). The average MPR is 18.42%. This figure is relatively high, as it has implications for the cost of borrowing. With this rate, the average lending rate within the banking industry should be hovering around 24.42%, which is high for the growth of the real sector.





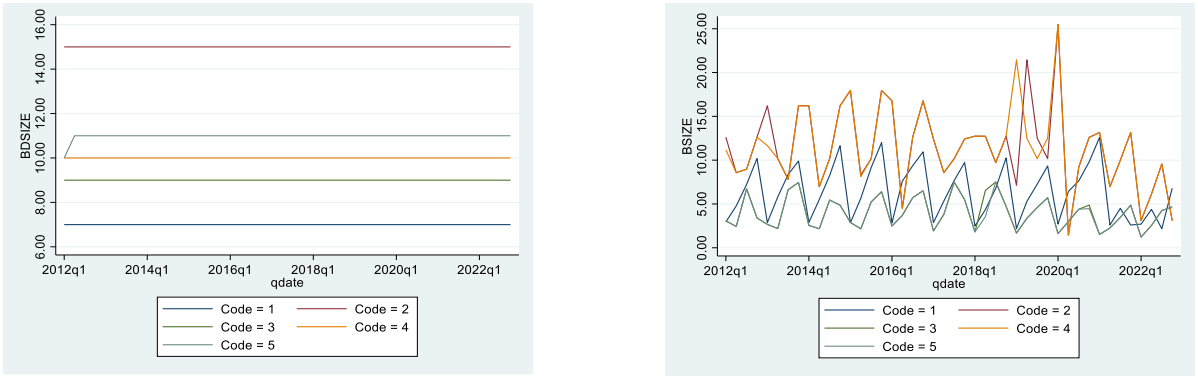


Fig. 1: Trend Analysis of ROA, CAR, Board Size and Bank Size of Sampled Banks. Code 1 = Ecobank, Code 2 = GCB Bank, Code 3 = Stanbic Bank, Code 4 = ADB and Code 5 = Cal Bank

The trend analyses in Figure 1 compares the behaviour of the various variables of the sampled banks namely ROA, CAR, Board and Bank Size. Comparatively, the performance of GCB Bank and ADB have been remarkable all through the period averaging 4.13% each. The two banks display similar trend. Ecobank performed relatively better than Stanbic Bank from the 2012q1 to 2017q1 beyond which both have been relatively at par. Notwithstanding this shift, Ecobank's average performance of 2.38% over the ten years far exceeded the 1.88% by Stanbic Bank. Similarly, regarding the CAR, GCB Bank and ADB started with a little above 40% but ended the year 2022 with a little below 40%. Again, the average CAR for these banks over the period is 31.92% each. Ecobank also started with a little above 10% but improved over the years ending the period with about 37% and recording a period average of 26.31%. The CAR of Stanbic Bank and Cal Bank has remained relatively stable around 5% with a period average of 3.31% and 3.24% respectively. It can be noticed that it is only between the last and first quarters 2020 and 2021 that Stanbic Bank displayed a step over Cal bank. It needs to be highlighted that while ADB and Stanbic Bank have consistently operated above the regulatory requirement of at least a CAR of 10%, Stanbic Bank and Cal Bank on the contrary need to improve to reach the required threshold. Regarding the Board size, GCB Bank has maintained a size of 15, followed by Cal Bank with 11, 10 for ADB, 9 for Stanbic Bank and 7 for Ecobank. With the size of the bank, both GCB Bank and ADB have the largest size (measured as the ratio of Tier 1 capital to total risk-weighted assets) followed by Ecobank and Stanbic Bank. Although GCB Bank is having almost twice as much the Board Size of ADB, it does not reflect in significant difference in the performance of any of the variables (ROA, CAR, and Bank Size) under consideration between the two banks. This visual display seems to suggest a very weak relationship, if any, between Board Size and these variables for the two banks.

Table 3: Fixed-Effect (Within) Regression Results

Independence Variable	β	Std	P-value	Explanation
lnCAR	0.634**	0.061	0.000	Significant
lnBDSIZE	1.014	3.779	0.789	Insignificant
lnBDIND	0.902	0.572	0.117	Insignificant
lnBSIZE	0.134*	0.064	0.038	Significant
lnINFL	0.539**	0.148	0.000	Significant
lnRGR	0.024	0.027	0.384	Insignificant
lnNPLR	0.168	0.158	0.291	Insignificant
lnMPR	-0.501*	0.208	0.017	Significant
Constant	-3.257	8.748	0.710	Insignificant
R-square (within)	0.5322			
R-square (between)	0.8743			
R-square (overall)	0.5406			
F (8,187)	26.59	Prob> F	0.000	
Number of Observations	200			
Number of groups	5	rho	0.746	

Legend: *p < 0.05; **p < 0.01.

Table 4.2 above shows the fixed effect (within) regression results. The results showed that the capital adequacy ratio (CAR), board size (BDSIZE), bank size (BSIZE), board independence (BDIND), inflation (INFL), the growth rate in real GDP (RGR), and the non-performance loan ratio (NPLR) all have a positive relationship with the return on assets of the studied banks. However, only the capital adequacy ratio, bank size, and inflation have statistically significant effects. The insignificance of the board size points to the fact that it is not the size that matters but rather their quality and efficiency. This explains why although GCB Bank has almost as twice the board size of ADB but in terms of performance and other indicators, there was barely any difference. Furthermore, the monetary policy rate had a statistically significant negative effect on bank performance. Substituting the coefficient values in the regression model in equation 2, we get the following equation for the regression values:

$$lnROA_{it} = -3.257 + 0.634lnCAR_{it} + 1.014lnBDSIZE_{it} + 0.902lnBIND_{it} + 0.134lnBSIZE_{it} + 0.539lnINF_{it} + 0.024lnRGR_{it} + 0.168lnNPLR_{it} - 0.501lnMPR_{it}.$$

The implications are that a 1% increase in capital adequacy ratio, bank size, and inflation increases return on assets by 0.634%, 0.134%, and 0.539%, respectively. However, banks' financial performance decreases by 0.501l% with every 1% increase in the monetary policy rate of the BoG; all other factors held constant. The results also suggest that the independent variables can explain 54.06% of the variations in the performance of listed banks in Ghana as indicated by the R-square value overall in table 4.2 above.

These results are in line with the results of Syafrizal, Ilham, and Muchtar (2023) and Bhattarai (2021), which also showed a statistically positive influence between capital adequacy, board size, firm size, and financial performance of commercial banks, except that in this study board size was insignificant. On the other hand, the outcome of this study is different from the results of Sahyouni and Wang (2019) and El-Chaarani et al. (2023), who revealed that there is no substantial impact between the capital adequacy ratio, board size, firm size, and return on assets of commercial banks in Africa. On the insignificance of board size, our result confirms that of Sahyouni and Wang (2019)

and El-Chaarani et al. (2023). Our result further showed that board independence has a positive but insignificant impact on the performance of listed banks in Ghana. This is consistent with the findings of Abubakar et al. (2023), whose work found board independence to have insignificant effects on the financial performance of commercial banks in Nigeria.

On the other hand, this result is different from the findings of Affes and Jarboui (2023), who found that corporate governance attributes have a positive effect on the financial performance of commercial banks. Including macroeconomic and policy variables in this study makes it distinct from earlier studies. The result showed that inflation positively impacts banks' performance, whereas adjustments in the BoG's policy rate affect their performance adversely. In this study, while GDP did not significantly affect bank performance, inflation did. This result is consistent with the literature in that some studies find no significant impact of macroeconomic factors on bank performance (Simiyu, 2015; Kanwal & Nadeem, 2013; Evans & Kiganda, 2014), while others, Sheefeeni (2015), Combey and Togbenou (2017), and Olokoyo et al. (2021), acknowledge the influence of inflation, GDP, and the exchange rate on bank profitability.

Contrary to the results of this study, Olokoyo et al. (2021) showed that growth promotes bank performance but, consistent with our result, found that a high-interest rate hinders bank performance. Again, like this study, they found that inflation had a positive relationship with bank performance, but unlike our result, theirs was statistically insignificant. The above analysis reveals, therefore, that the capital adequacy ratio, bank size, inflation dynamics, and the monetary authority's regulation of the policy rate are critical indicators of bank performance in Ghana, and for that matter, there is a need to keep an eye on them.

Table 4: Post Estimation Tests

Test Type	F-Statistic/Chi-Square value	Probability	Result
Modified Wald test for groupwise heteroscedasticity in fixed effect regression model	6.74	0.2409	No Heteroscedasticity
Woodridge test of autocorrelation in panel data	3.125	0.1518	No Autocorrelation
Jarque-Bera	5.021	0.0812	Normally Distributed

Table 4.3 indicates that the model is reliable for policy recommendation or analysis since the post-estimation tests reveal no heteroscedasticity or autocorrelation, and the errors follow a normal distribution.

5. Conclusion and policy recommendations

The objective of the paper was to determine the impact of capital adequacy ratio and board characteristics on the financial performance of listed banks in Ghana. Since the capital adequacy ratio is positively related to the financial performance of listed universal banks in Ghana, it can be concluded that the Tier 1 and Tier 2 capital of these banks are the basic resources of the banks and should not be taken for granted. Again, the size of the bank also has a positive influence on the performance of the banks. It can therefore be concluded that the higher the number of branches of the bank, the better the performance. However, the independence of the board of directors has an insignificant negative impact on bank performance. It can be concluded that the number of non-executive officers on the board does not matter rather their quality and effectiveness. Furthermore, in Ghana, monitoring inflation dynamics and the monetary authority's regulation of the policy rate is crucial for enhancing bank performance.

Based on the study's findings, we recommend the following for policy action by managers of universal banks, monetary authorities in Ghana, and the government.

1) The study results reveal that the average board size of banks is ten members. However, some banks must comply with the corporate governance guidelines set by the Bank of Ghana (BoG), with their board size ranging from 7 to 15 members. Therefore, owners of universal banks should take the BoG's corporate governance guidelines seriously and recommend that the Board of Directors consist of at least 13 members with diversified areas of expertise.
2) The capital adequacy ratio has emerged as a critical driver of banks' performance in Ghana. The study recommends that universal banks adhere strictly to the required CAR from the Central bank.
3) The size of a Bank is an important factor that affects its performance. To improve their performance, universal banks should consider opening more branches in district capitals to mobilize liquidity from those with surplus funds. This will help increase the availability of loanable funds for businesses to borrow for their daily operations. Additionally, further studies are needed to determine the optimal number of directors on the board to ensure the optimal performance of universal banks in Ghana.
4) Inflation also emerged as a critical variable in determining banks' performance in Ghana. The government and the Bank of Ghana must respectively ensure that they control inflation by curtailing expenditure in unproductive sectors of the economy and effectively regulating the money supply, as any excesses will undermine the performance of banks.
5) The regulation of monetary policy rates has hurt the performance of banks. This is due to its effect on lending rates, investments, and overall demand for money. It is recommended that the Bank of Ghana (BoG) maintain a reasonable rate to address this issue. Achieving this goal will require the central bank to control the money supply while the government takes steps to reduce inflationary tendencies.

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