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The Impact of Capital Adequacy and Bank Size on Profitability of Ghanaian Banks

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Abstract

This study examines the influence of capital adequacy ratio and bank size on the profitability of Ghanaian banks from 2008 to 2017, while also considering macroeconomic factors such as inflation and the monetary policy rate. Using return on assets (ROA) as the measure of profitability and analyzing data from seven recapitalized banks and the Bank of Ghana, the study employs the Ordinary Least Squares (OLS) technique. The findings reveal that capital adequacy ratio and bank size significantly boost profitability, inflation positively impacts it, and the monetary policy rate has a negative effect. The study recommends that the Bank of Ghana increase regulatory capital requirements and keep the policy rate low to enhance bank stability and profitability.

Keywords: Capital adequacy, Bank size, Return on asset, ordinary least squares, Ghana

1.0 Introduction

The banking sector plays a crucial role in the financial system of every economy by channeling funds from savers to borrowers (Singh, 2010). In Ghana, banks dominate the financial industry, comprising about 70% of the sector as of 2008 (Kwakwa, 2014). Consequently, the commercial banking sector is essential for economic growth, as its failure can significantly impact the entire economy.

The Ghanaian banking sector has experienced various reforms and restructuring due to internal and external economic changes and shocks. For example, the Bank of Ghana adopted the International Financial Reporting Standards (IFRS) to align with international standards and reduce systemic risk. Other initiatives include establishing a Collateral Registry and Credit Reference Bureaus to enhance transparency and credit access, creating the Financial Intelligence Centre (FIC) to combat money laundering and terrorism financing, and requiring bank recapitalization. These measures aim to mitigate risks and stabilize the banking system, significantly altering how commercial banks in Ghana operate and affecting their performance. Profitability is a critical metric for assessing bank performance but has been under pressure due to the evolving banking landscape. It is vital for the sustainability of commercial banks. With the rapid growth of financial markets, banks face intense competition, and existing performance management standards are inadequate for strategic growth (Derbali, 2011). Given the decreasing profits in increasingly complex market structures, bank managers must understand the key factors influencing profitability. Identifying these factors is crucial for implementing policies that enhance profitability and support economic growth.

Singh (2010) identifies various factors affecting a bank's profitability, categorized as internal and external. Internal factors are related to the bank's management and efficiency, while external factors pertain to the operating environment. This study aims to assess the impact of capital adequacy ratio and bank size on bank profitability in Ghana, controlling for external factors.

The capital adequacy ratio is a prime regulatory mechanism for assessing a bank's financial soundness and has garnered attention from international regulatory authorities (Milli et al., 2017). Banks and regulators have adopted international regulations based on Basel Committee recommendations to promote banking system soundness. In Ghana, the Bank of Ghana increased the minimum capital base for banks from GH¢120 million to GH¢400 million in

2017, reducing the number of operating banks from 34 in 2018 to 23 by 2019. This recapitalization aimed to restore confidence and build a resilient banking system. Extant literature indicates that the capital adequacy ratio also enhances bank profitability in both developed and emerging economies. This study aims to validate or refute the profitability-enhancing effect of the capital adequacy ratio using data from recapitalized Ghanaian banks. Although some studies have examined the direct impact of the capital adequacy ratio on bank profitability, there is limited evidence from Ghana. Therefore, this study contributes to the literature by exploring this relationship in the Ghanaian context.

The study employs the Ordinary Least Squares (OLS) technique, which provides reliable estimates, particularly for samples with comparable features like Ghanaian banks. This technique is suitable given the study's small sample size and period. The findings will assist regulatory authorities and bank executives in designing policies to improve the profitability of Ghana's banking sector. This study will contribute to the literature by either confirming or refuting existing findings on the capital adequacy-financial performance relationship.

2.0 Literature Review

2.1 Theoretical Literature

Buffer Theory of Capital Adequacy

Calem and Rob's (1996) Buffer Theory of Capital Adequacy is a key theory in this study. This theory suggests that banks might maintain an extra "buffer" of capital to reduce the risk of failing to meet regulatory capital requirements, especially if their capital adequacy ratio is highly volatile (Aruwa & Mohammed, 2014). According to this theory, a bank nearing the minimum required capital ratio may be incentivized to increase its capital and reduce its risk to avoid the penalties associated with failing to meet capital requirements. Conversely, banks with low capitalization might take on additional risks, hoping that higher expected returns will help increase their capital.

Efficiency Theory

Demsetz (1982) introduced the efficiency theory, which posits that better managerial skills enhance a bank's efficiency and profitability. The theory implies that managerial efficiency not only boosts bank profitability but also enables the bank to gain market share and increase market concentration. Another aspect of the theory is that the link between efficiency and size results from positive profit concentration. The hypothesis asserts that a strong relationship between concentration and profitability arises from low costs, which are mainly achieved through efficient management practices (Birhanu, 2012). By effectively utilizing their management skills, managers can increase market share, and when aligned with business goals, this increase in market share also enhances profitability. Since managers control internal factors, they can leverage this theory to improve their competencies.

2.2 Empirical literature

Studies on the impact of capital adequacy on bank profitability

A bank's capital adequacy ratio (CAR), which measures the value of its capital relative to its weighted risks, is essential for regulators as it indicates a bank's solvency and its ability to absorb losses with its capital reserves. Studies have extensively examined the impact of CAR on bank profitability. For instance, Vyas et al. (2008) found a positive and significant impact of capital adequacy requirements on Indian banks' performance from 1997 to 2007. Similarly, Mbizi (2012) discovered a significant positive relationship between bank capitalization and performance in Zimbabwe. Conversely, Ikpefan (2013) observed a negative impact of capital adequacy on Nigerian banks' return on assets from 1986 to 2006. Ejoh and Iwara (2014) confirmed that capital adequacy is crucial in explaining return on assets in Nigerian banks. Ayaydin and Karakaya (2014) noted that increasing bank capital influences risk and profitability both positively and negatively in the Turkish banking sector. Căpraru and Ihnatov (2014) found that higher capital levels led to better performance in banks from Central and

Eastern European countries. Torbira and Zaagha (2016) reported a significant relationship between capital adequacy and profitability in Nigerian banks. Bitar et al. (2018) showed that higher-quality capital reduces inefficiencies and enhances profitability across 39 OECD countries. Al-Homaidi et al. (2018) highlighted a significant influence of CAR on the net interest margin of Indian banks. Ajayi et al. (2019) and Jeris (2021) both found a strong positive association between CAR and bank profitability in Nigeria and Bangladesh, respectively. However, Antwi (2019) reported that capital adequacy negatively affects return on assets and return on equity in Ghana. Nguyen (2020) demonstrated a positive correlation between CAR and profitability metrics in Vietnamese banks during the implementation of the Basel II Accord. These studies collectively highlight the diverse impacts of capital adequacy on bank profitability across different regions and periods, reflecting both positive and negative influences depending on specific contexts and methodologies.

Studies on the impact of bank size on bank profitability

The influence of bank size on profitability has been a focal point in various studies on bank performance. Flamini et al. (2009) analyzed 389 banks across 41 Sub-Saharan African nations, revealing that larger banks tend to have higher profitability, as measured by return on assets. Sufian (2009) studied Chinese banks from 2000 to 2007, finding a positive correlation between size and profitability for both State-Owned Commercial Banks (SOCBs) and Joint Stock Commercial Banks (JSCBs). Conversely, Curak et al. (2012) observed that bank size did not affect profitability in Macedonian banks from 2005 to 2010. Aladwan (2015) found that smaller and medium-sized banks in Jordan outperformed larger ones in terms of return on equity between 2007 and 2012. In Kenya, Gatete (2015) used financial data from 43 banks to conclude that size had a modest positive impact on profitability. Chronopoulos et al. (2015) similarly discovered a significant positive effect of size on profitability among US commercial banks from 1984 to 2010. Ali et al. (2018) examined the relationship in Pakistan and found a positive

link between size and profitability for both commercial and Islamic banks, though it was not statistically significant for the latter. Parvin et al. (2019) reported a positive association between bank size and return on assets in Bangladeshi banks from 2011 to 2015. However, Tharu and Shrestha (2019) found no significant impact of size on profitability for Nepalese banks from 2013 to 2018. Yakubu (2019) identified a significant positive effect of bank size on profitability in Ghana between 2008 and 2017. Kumar and Bird (2021) noted that bank size is a crucial determinant of profitability in both Chinese and Indian banks. In the case of Sub-Saharan Africa, Yakubu and Bunyaminu (2024) revealed that bank size significantly drives bank profitability though the impact varies depending on the measure of bank profitability.

Literature on the impact of macroeconomic factors on bank profitability

Given that the study controls for macroeconomic factors, it is important to consider various empirical findings on this. Seferli (2010) examined Azerbaijan's banking sector from 2003 to 2008, using data from 29 commercial banks, and found that both GDP and inflation negatively impacted bank profitability. In Namibia, Sheefeni (2015) analyzed quarterly data from 2001 to 2014, discovering that GDP, inflation, and interest rates had minimal effects on the profitability of commercial banks. Boadi et al. (2016) studied the profitability determinants of rural and community banks in Ghana from 2005 to 2013 and found significant effects of GDP growth and inflation on profitability. Topak and Talu (2017) investigated Turkish banks and reported that real GDP and interest rates positively influenced profitability, whereas exchange rates had a negative effect. Zampara et al. (2017) found that, for Greek banks from 2001 to 2014, unemployment negatively affected profitability, while GDP growth had a positive impact. Luft and Omarhil (2018) compared Islamic and conventional banks in Pakistan, revealing that GDP and inflation positively correlated with performance in the long term, while interest rates had no effect. Buzayehu et al. (2020) evaluated Ethiopian banks from 2000 to 2017 and found that broad money supply negatively affected profitability, while inflation and GDP had positive

effects. Caliskan and Lecuna (2020) identified that exchange rates, interest rates, and inflation significantly impacted Turkish banks' performance from 1980 to 2017. Jreisat and Bawazir (2021) found that economic growth positively influenced bank profitability in the MENA region during 2008-2016. Lastly, Horobet et al. (2021) analyzed the profitability determinants of banks in Central and Eastern European countries from 2009 to 2018, finding that unemployment, inflation, and budget balance had negative effects on profitability.

3.0 Research Methodology

3.1 Data and Sources of Data

The research employs secondary data to achieve its objectives. Secondary data are advantageous due to their accessibility, cost-effectiveness, and ease of collection. For this study, financial statements from individual banks provided data on bank-specific variables, while macroeconomic data was sourced from the Bank of Ghana, covering the period from 2008 to 2017. This timeframe was selected as it offers recent time-series data and reflects a significant developmental phase for Ghana's banking sector, especially concerning capital regulation. The sample considers recapitalized banks, with a focus on seven banks including “Ecobank, Fidelity Bank, GCB Bank Limited, Société Générale, Standard Chartered Bank, Agricultural Development Bank, and Zenith Bank”.

3.2 Description of Variables

Dependent Variable

The study uses Return on Assets (ROA) to gauge bank profitability, consistent with previous research (Al-Tamimi & Hussein, 2010; Almazari, 2011; Sinha & Sharma, 2016; Yakubu et al., 2017; Horobet et al., 2021; Bunyaminu et al., 2021; Bunyaminu et al., 2022; Bashiru et al., 2023). ROA is calculated as net income divided by total assets, providing insight into how effectively a bank's management utilizes its assets compared to other profitability metrics.

Independent Variables

Capital Adequacy Ratio (CAR): CAR, determined by the ratio of equity to total assets, measures a bank's financial strength (Ünvan & Yakubu, 2020). A higher CAR suggests that a bank relies less on external funds, which is expected to positively impact profitability.

Bank Size (BSIZE): Bank size is represented by the natural logarithm of total assets (Yakubu & Oumarou, 2023). Larger banks are anticipated to have a positive relationship with profitability due to their ability to scale operations and increase earnings (Bougatef, 2017).

Control Variables

Inflation (Inf): Measured by the annual percentage change in consumer prices, inflation indicates macroeconomic stability. It can either negatively impact profitability by introducing economic uncertainty or positively affect it by increasing demand for bank loans.

Monetary Policy Rate (MPR): The rate at which banks borrow from central banks, influencing the interest rates for loans. A higher MPR generally benefits banks' profitability, thus a positive effect on profitability is anticipated.

3.3 Model Specification and Analytical Approach

The research utilized a panel data technique, which aggregates observations across various time periods and a set of units. This method helps reveal effects that might be missed in purely cross-sectional or time-series studies. The general form of the panel model is:

$$Y_{it} = \alpha_0 + \beta X_{it} + \varepsilon_{it} \dots\dots\dots (1)$$

Where i represents the cross-sectional dimension and t denotes the time-series dimension. Y is the dependent variable, specifically bank profitability, while X includes the independent variables. The coefficient β measures the impact of these independent variables, and α is considered constant.

In exploring the relationship between bank profitability and various bank-specific and macroeconomic factors, the specified model for this study is as follows:

$$ROA_{it} = \alpha_0 + \beta_1 CAR_{it} + \beta_2 BSIZE_{it} + \beta_3 INF_{it} + \beta_4 MPR_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

The acronyms are further explained in the variable description section.

For data analysis, the study employed Ordinary Least Squares (OLS), a method known for providing reliable estimates, especially when α is assumed to be consistent across banks.

4.0 Research Findings

4.1 Descriptive Statistics of the Variables

Table 1 presents the descriptive statistics for all variables examined in the study, including their means, standard deviations, minimum, and maximum values. The Return on Assets (ROA), a measure of bank profitability, varies between -4.7% and 9.3%, with an average of 4.2%. The Capital Adequacy Ratio, which averages 13.6%, ranges from 4.4% to 19.9%, indicating that the average ratio of the banks in the sample exceeds the Basel III requirement of 8%. The average bank size, with a mean of 14.47, suggests that the banks in this study are relatively small, with sizes ranging from 12.30 to 16.08. Inflation rates average 13.65%, with a range from 7.13% to 19.25%. The average monetary policy rate is 18.45%, varying between 12.50% and 26.0%.

Table 1. Descriptive Statistics

	Mean	Std. Dev.	Minimum	Maximum
ROA	0.042	0.026	-0.047	0.093
CAR	0.136	0.034	0.044	0.199
BSize	14.466	0.827	12.300	16.080
INF	13.647	3.911	7.126	19.251
MPR	18.450	4.456	12.500	26.000

4.2 Correlation Analysis

Table 2 illustrates the correlation among the independent variables. According to Kennedy (2003), a high correlation is characterized by a correlation coefficient exceeding 0.80. The values of the correlation coefficients between the explanatory variables are generally low, suggesting that there is no significant multicollinearity present in the study.

Table 2. Correlation Analysis

	CAR	BSize	INF	MPR
ROA				
CAR	1.000			
BSize	0.223	1.000		
INF	0.116	0.016	1.000	
MPR	0.273	0.531	0.701	1.000

4.3 Test for Multicollinearity

The Variance Inflation Factor (VIF) analysis was utilized to check for multicollinearity, following the guidelines of Gujarati (2003). Multicollinearity is indicated if the VIF exceeds 10 and the tolerance value falls below 0.10. However, the results in Table 3 indicate that multicollinearity is not an issue among the variables, as all VIF values are below 10 and all tolerance values are above 0.10.

Table 3. Tolerance Value and Variance Inflation Factor Analysis

	<i>Collinearity statistics</i>	
	VIF	Tolerance
MPR	4.32	0.231
INF	3.04	0.329
BSize	2.14	0.467
CAR	1.10	0.913
Mean VIF	2.65	

4.4 Discussion of Results

The results of the ordinary least squares (OLS) regression on the impact of various factors on bank profitability are detailed in Table 4. The R-square value of 0.285 indicates that

approximately 28.5% of the variation in bank profitability can be explained by changes in the capital adequacy ratio, bank size, inflation, and the monetary policy rate. This implies that the remaining 71.5% of the variation is due to other factors not included in the model. The model's significance is supported by the F-statistic and its probability value, indicating that the factors considered are important determinants of bank profitability.

Table 4. Regression Results

Variables	Coefficient	Std. Error	t-statistic	Prob.
CAR	0.226	0.084	2.68	0.009
BSize	0.019	0.005	4.07	0.000
INF	0.002	0.001	1.74	0.086
MPR	-0.004	0.001	-2.95	0.004
C	-0.230	0.063	-3.63	0.001
R-square	0.285			
Adjusted R-square	0.241			
F-statistic	6.470			
Pro.(F-statistic)	0.000			

The findings reveal that capital adequacy has a significant positive impact on bank profitability. This suggests that the banks in the sample are well-capitalized, enabling them to efficiently convert funds into earnings. Additionally, well-capitalized banks have the financial strength to expand their lending activities, thereby enhancing their profitability. These results are consistent with previous studies (Bitar et al., 2018; Ajayi et al., 2019; Jeris, 2021).

Bank size also has a significant effect on profitability, with larger banks being more profitable. This can be attributed to their ability to diversify banking activities and conduct extensive research to improve product quality and offer innovative services, contributing to profit growth. This finding aligns with earlier research (Sufian, 2009; Parvin et al., 2019; Yakubu, 2019).

Among the control variables, inflation has a positive and significant effect on profitability at the 10% significance level, indicating its importance for bank profitability. As inflation increases, banks' profits tend to grow. Conversely, the monetary policy rate has a negative and statistically significant impact on profitability. An increase in the monetary policy rate leads to

a decrease in bank profitability, as higher rates can deter clients from taking loans, thereby reducing bank profits.

5.0 Conclusion

This research investigated the influence of the capital adequacy ratio and bank size on the profitability of banks in Ghana from 2008 to 2017. Bank profitability was measured using return on assets (ROA), consistent with prior studies. The analysis accounted for the effects of inflation and the monetary policy rate, both considered macroeconomic factors. Data sources included the annual reports and financial statements of various banks, as well as information from the Bank of Ghana. Following a multicollinearity test, the study employed the Ordinary Least Squares (OLS) method for analysis. The findings revealed that the capital adequacy ratio, bank size, and monetary policy rate significantly impact bank profitability. The study concludes that while both capital adequacy and bank size enhance profitability, the monetary policy rate decreases the profit levels of commercial banks in Ghana.

6.0 Recommendations

Based on the research findings, several policy recommendations have been proposed. First, since capital adequacy positively impacts bank performance, the Bank of Ghana should consider raising the regulatory capital requirements. This would allow banks to maintain higher capital reserves to withstand external economic shocks, contributing to a more stable banking sector. Additionally, banks can enhance their profitability by expanding their asset base, which can be achieved by opening more branches and investing in promising projects. Given the negative effect of the monetary policy rate on profits, it is advisable for the Bank of Ghana to keep this rate low. A lower policy rate would enable banks to offer more affordable loans to customers, thereby increasing credit availability and boosting profits. Overall, this research aims to inform the development and implementation of effective policies and strategies to improve bank performance in Ghana.

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