UNIVERSITY OF EDUCATION, WINNEBA

ANALYSIS OF FACTORS AFFECTING PROFITABILITY OF COMMERCIAL BANKS IN GHANA: THE CAMEL APPROACH

ERIC MENSAH-DADZIE
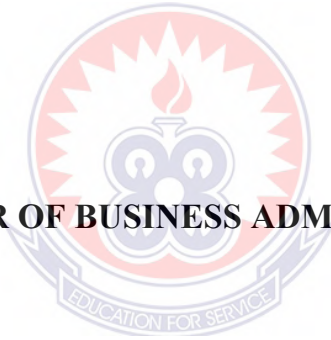
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ANALYSIS OF FACTORS AFFECTING PROFITABILITY OF COMMERCIAL BANKS IN GHANA: THE CAMEL APPROACH

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NOVEMBER, 2022

DECLARATION

Candidate's Declaration

I, **Eric Mensah-Dadzie,** declare that this work except quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my original work, and it has not been submitted either in part or whole for another degree anywhere.

Signature: ……………………………..

Date: ………………………………….

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines of supervision of dissertation laid down by the University of Education, Winneba.

Dr. Charles Omane-Adjekum (Supervisor)

Signature: ……………………………..

Date: ……………………………………..

DEDICATION

To my lovely sister the Late Ruth Mensah-Dadzie

ACKNOWLEDGEMENT

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ABSTRACT

The research aimed to analyze the factors that determine the profitability of commercial banks in Ghana using the CAMEL methodology, as well as to differentiate the effects of different types of bank ownership. A 12-year (2010-2021) panel data was collected from 9 listed commercial banks selected using purposeful sampling technique. Using a panel regression technique (pooled least square and random effect), the findings indicated that private banks outperformed their public sector counterparts in terms of capitalization, asset quality, management efficiency, and profitability, likely due to greater investment in cost-reducing strategies. It was also found that the CAMEL framework has statistically significant effect on the banks' performance. It was concluded that to remain competitive and resilient to economic shocks, efficiency goals should be prioritized, staff should have a solid grasp of CAMEL, and there should be robust engagement between regulators and banks. It was therefore recommended that commercial banks should improve credit risk management and branch out into non-traditional areas to boost profitability and sustain expansion.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The COVID-19 pandemic triggered the world's greatest economic recession by causing a significant global economic shock (Organization for Economic Cooperation and Development [OECD], 2020). Although the global economy is on the road to recovery, the rebound is anticipated to be uneven across countries, with strong growth in major economies while many developing economies continue to lag (World Bank, 2021).

Countries in Sub-Saharan Africa are among those most severely impacted by the pandemic and are anticipated to have experienced significant setbacks in development and increases in per capita income by at least ten years (African Development Bank, 2021; World Bank, 2021).

Economic and financial conditions in developing countries continue to suffer as a result of ongoing large-scale containment measures being implemented by governments and uncertainty surrounding the pandemic's duration, making recovery more uneven, challenging, and uncertain (Katusiime, 2021). The COVID-19 health crisis resulted in a number of difficulties, including a worsening of the economic downturn, job losses, intense inflationary pressure, higher unemployment rates, and an increase in crime, among others (Iwedi et al., 2020). According to Alarussi, and Alhaderi (2018), during the crisis, businesses focused on maintaining their financial stability by taking drastic action. However, the combination of insufficient knowledge and high stakes almost always backfires, worsening the company's financial position.

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In the banking sector, although Fitriyah et al. (2021) and Basyir (2021) found a fairly healthy Islamic commercial bank in phase of the covid 19 crises. In contrast commercial banks (CBs) experienced a loss in efficiency during the covid 19 pandemic (Gazi, 2022). Amnim et al. (2021) explained that the government-imposed partial and total lockdowns during COVID-19 Pandemic increasingly hindered firms' access to inputs at the local markets, difficulty in exporting and importing goods which affected both the firm's liquidity and profitability negatively. Other studies on the effect of covid-19 on banking profitability of commercial banks could not say otherwise (Aldasoro et al., 2020; Ihsan & Hosen, 2021; Ferdinandus, 2020).

Commercial banks play a crucial role in the allocation of a nation's economic resources. Continuously, they transfer money from savers to those who invest. If their revenue is higher than their costs of operation, they will be able to sustain their operations. In other words, for the intermediation function to be sustainable, banks must be profitable (Varaprasad & Rao, 2019). Especially for joint stock commercial banks, profits are the ultimate aim, making net profit indicators of interest to bank managers and investors (Saeed et al., 2020). Return on Assets (ROA), Return on Equity (ROE), and net interest rate are all metrics used to evaluate bank profitability (Anggono, 2017).

A bank's ROA is defined as the average ratio of pretax profit to total assets (Anggono, 2017). This is a metric used to evaluate the profitability of a bank. Put another way, this metric shows how efficiently a commercial bank uses its resources to maximize profits. If a bank has a high Return on Assets (ROA), it means that it is making good use of its capital.

On the other hand, Return on Equity (ROE) measures a bank's profit relative to its equity. This ratio shows bank shareholders' return on investment, so it's important. High ROE banks generate cash flow. Profits increase with ROI. ROE is calculated by dividing Net Income by Average Tax by Total Equity. This ratio reflects the bank's management by showing the return on shareholders' money. Higher ROE indicates more efficient management of shareholder capital (Assfaw, 2018).

The difference between a bank's interest income and expense, such as interest income received and interest expense paid to a lender for deposits, is referred to as the net interest margin (NIM). Net interest margin is defined as the difference between a bank's interest income on loans and securities and its interest costs (Assfaw, 2018). It reflects the efficiency of banks and the costs of intermediation. A bank with a higher net profit rate is more profitable and stable. The net profit rate is an important ratio for determining a bank's profitability.

To assess the profitability of banks, the CAMEL rating system is an effective monitoring measure (Varaprasad & Rao, 2019; Nguyen et al., 2020). This method was first used in the US in 1979 to measure profitability and bank ratings (Zaidanin, 2020). CAMEL model helps experts examine banking system profitability (Nguyen et al., 2020).

The acronym CAMEL represents; Capital adequacy ratio (CAR), Asset quality (AQ), Management efficiency (ME) and Liquidity. The Capital Adequacy Ratio (CAR) reflects banks' internal wealth to withstand economic crises (Madugu et al., 2020). Asset quality reflects the relation between loan portfolio and profitability of the bank. According to Said (2018), non-performing loans pose the greatest threat to commercial banks. Therefore, inappropriate lending rates are strong indicators of the

asset's quality. General organizational management, information systems, internal audit and control, strategic and budgetary plans are all examples of management efficiencies. The ability of the bank to perform its obligations, primarily to depositors, is referred to as liquidity. Reschiwati et al. (2020) demonstrated that a bank's liquidity adequacy was related to its profits.

Bank size, inflation, credit risk, net interest margin, capital adequacy and cost to income ratio are the factors affecting bank profitability in Ghana (Boateng, 2018). Despite increasing minimum equity capital, Musa (2018) discovered that banks in Ghana are highly leveraged, with debt financing accounting for 84 percent of total capital, 77 percent of which is short-term debt. Bank profitability was positively associated with firm size, foreign ownership, and bank age, while customer deposit growth was negatively associated (Musa, 2018). Other studies have found that commercial banks in Ghana that rely on short-term financing (deposits) lose money. In Ethiopia, capital adequacy, management efficiency, and bank size all have a positive impact on the ROA, ROE, and NIM of private commercial banks. Bank performance suffers as a result of liquidity management (ROE). The study also discovered that asset quality was not a significant predictor of the financial performance of private commercial banks (Varaprasad & Rao, 2019).

Although there have been studies of profitability in commercial banks all over the world, including Ghana, previous findings have been incongruent, making generalizability doubtful. Furthermore, no extensive research has been conducted on the profitability of commercial banks in Ghana following the Covid-19 crises. This study will help to fill that gap by providing findings on the current profitability state of Ghana's commercial banks as well as the factors influencing that state.

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1.2 Statement of the Problem

The allocation of funds among subsectors and a nation's economy depends on a robust and efficient banking system in every nation (Kirimi et al., 2022). Most banks recognize the importance of profitability, but they may be unsure of how to improve it or the factors that influence it. Alarussi and Alhaderi (2018) stated that during crisis, some companies attempt to preserve their finances by taking risky actions; however, these actions typically worsen their finances due to insufficient experience and high risks. When the economy slows down, banks face the difficulty of keeping up with demand and acquiring additional resources to balance the situation (Nguyen et al., 2022).

Evident is the covid-19 pandemic which caused the world's worst recession by causing a global economic shock (OECD, 2020). Impacting sub-Saharan African countries, the most (African Development Bank, 2021; World Bank, 2021). Numerous studies examining the impact of the pandemic on commercial banks have yielded inconsistent results across commercial banks in different nations. Fitriyah et al. (2021) and Basyir (2021) discovered a relatively sound Islamic commercial bank during the covid-19 crises. Nonetheless, some non-religious commercial banks have reported poor banking conditions during the pandemic (Aldasoro et al., 2020; Ihsan & Hosen, 2021; Ferdinandus, 2020; Nguyen et al., 2022).

Both practitioners and scholars have intensified efforts in identifying the factors that affect bank profitability, as existing strategies employed remain inadequate (Alarussi & Alhaderi, 2017). There are contradictory findings regarding the factors that affect the profitability of commercial banks. For instance, Thinh and Le Xuan (2022) found a positive correlation between liquidity and the profitability of banks. In contrast, the

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study of Parvin et al. (2019) and Varaprasad and Rao (2019) revealed a negative relationship between liquidity and profitability. Zaidanin (2021) found a weak positive relationship between capital adequacy, liquidity, loans-to-deposits, and return on assets (2021). Al-Homaidi et al. (2020) found that capital adequacy affects ROA. Asset quality positively affects ROE, while liquidity and have no effect. Budhathoki and Rai (2020) found that asset quality and capital adequacy affect bank profitability.

In Ghana, factors that contribute to the profitability of banks have been the subject of scant research (Doku et al., 2019). Some of the factors influencing profitability that were investigated were liquidity and capital adequacy ratio. Capital adequacy ratio was discovered to have a negative impact on profitability (Madugu et al., 2020; Akomeah et al., 2020). According to Twum and Bathuure (2020), the liquidity ratio has a positive relationship with commercial bank profitability. Although these studies assessed the factors that influence profitability, they did so on a broad scale with little distinction.

Although earlier studies (Madugu et al., 2020; Akomeah et al., 2020; Bathuure, 2020) have examined the factors that influence commercial bank profitability, the set of factors identified in these studies failed to capture the entire scope of the CAMEL framework which rendered their study inexhaustive. For instance, Madugu et al. (2020) identified some of the factors and compared them based on foreign and local banks in Ghana. However, their focus was on the effects of credit risk and capital adequacy ratio but not the entire CAMEL approach. The need to conduct a yearly comparative study using the CAMEL approach was underscored by Kirimi et al., 2022, who accentuated that a yearly comparative study using the CAMEL approach would provide more insights into the factors that contribute to the differences in

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profitability of banks, hence contributing to practice, theory, and banking literature. In response to this call, this study seeks to examine the effect of CAMEL on profitability of banks in Ghana.

1.3 Research Objectives

The main objective of the study is to use the CAMEL approach to investigate the factors that influence the profitability of commercial banks in Ghana and to distinguish the impacts by bank ownership.

1. To assess the effect of the CAMEL framework on the profitability of commercial banks in Ghana.
2. To test the difference in the impact of the CAMEL framework on the profitability of commercial banks in Ghana by ownership.

1.4 Research Questions

1. What is the effect of the CAMEL framework on the profitability of commercial bank in Ghana?
2. What is the difference in the influence of the CAMEL framework on the profitability of commercial banks in Ghana by ownership?

1.5 Significance of the Study

Recent studies, particularly as the world faces a pandemic, have revealed lapses in commercial bank profitability around the world (Aldasoro et al., 2020; Ihsan & Hosen, 2021; Ferdinandus, 2020; Nguyen et al., 2022). As a result, it has become necessary to investigate the factors influencing commercial bank profitability and to compare these factors based on bank ownership.

It is impossible to overstate the significance of the study on the profitability determinants of Ghanaian banks especially after the covid-19 crises. This study is useful for various stakeholders, such as management/administration in commercial banks, to identify success and failure indicators in order to improve the performance of their respective banks and make the best decisions. It will also aid the government in formulating more effective policies and preventing liquidity crises. For Investors, this study will help them comprehend and protect their investment by revising their investment portfolio. Lastly, customers will be informed on the capacity of commercial banks to accept their deposits based on their success indicators. Moreover, this study is of the utmost importance in providing bank managers with a deeper understanding of management issues in order to identify the key profit-boosting variables. This study's findings will also contribute to the existing body of literature.

1.6 Delimitations of the study

This study aims to determine the factors influencing profitability of commercial banks in Ghana. Nine (9) out of 23 commercial banks were used in this study. As a result, the study is delimited to commercial banks operating within Ghanaian jurisdiction. Also, all the factors in the CAMEL framework such as Capital adequacy, Asset quality, Management Efficiency, Earnings Management (EM) and Liquidity were assessed. However, the study did not capture sensitivity as contained in CAMELS framework. Again the study employed a quantitative approach in data collection and analysis. As a result, the study's findings did not capture other qualitative aspect of the issues under review. Finally, profitability measures such as return on asset (ROA), return on equity (ROE) and net interest margin (NIM) were used.

1.7. Limitations of the Study

The major limitation of this study is time. The limited time frame within which to complete this project is a factor in delimiting the work to a Ghanaian context. Nonetheless, this limitation has not affected the applicability of the findings of this study in other jurisdictions due to the robustness of the models employed.

1.8. Definition of Terms

Capital Adequacy Ratio: Capital adequacy ratio is the ratio of a bank's equity and reserves to its total asset.

Asset Quality: Asset quality is the ratio of total non-performing loans to total/gross loans.

Management Efficiency: Management efficiency is defined as the ratio of operating expenses to total asset.

Earnings Management: Earnings management is defined as the ratio of interest income to total asset.

Liquidity: Liquidity is defined as the ratio of gross advances/loans to borrowings and deposits.

1.9 Organization of the Study

There are five chapters in this research work. The background of the study, the statement of the problem, the study's objectives, research questions, significance, delimitation, limitation, and definition of terms are all covered in chapter one. Chapter two examines current relevant literature on the CAMEL framework and profitability in order to gain a thorough understanding of the subject. In this chapter, relevant theories and empirical literature were reviewed and conceptual framework was

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developed accordingly. The third chapter outlines the research methods. In effect, thematic areas such as research design, population, sample and sampling procedure, data collection instrument, data collection procedures, and data processing and analysis considered. The fourth chapter bothers on results and discussion. In this chapter, research findings are presented in APA styled tables, interpreted and discussed accordingly. Finally, chapter centers on summary, conclusions and recommendations. In this chapter, the various research findings are summarized, relevant conclusions and recommendations are made.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The purpose of this chapter is to examine previous research efforts on topics that are related to the study that is now being conducted. It begins with a conceptual review, then moves on to a theoretical review, and then moves on to an empirical review. In contrast, the conceptual review details how the study variables and goals were investigated. The empirical review summarized the findings of previous studies relevant to the work and finally the summary and conceptual framework of the work.

2.1 Conceptual Review

2.1.1 Bank Profitability

The term "profit" refers to the amount of money left over after all expenses have been subtracted from sales, and is used as the foundation for determining taxable income and dividend distributions (Hamilton-Ibama, 2020). Profit is the primary sign of a firm's performance and the driving force behind any business, and banks are specific sorts of companies engaged in mobilising deposits and lending (Laeven et al., 2014). Profitability is not just a performance meter but also a requirement for the success of banks under competitive circumstances and the successful implementation of monetary policy. This is because profitability is not only a gauge of performance but also a precondition for success (Sanderson et al., 2018). The capacity of financial institutions to turn a profit is not only a key indicator of the institutions' overall health and stability but also a significant indicator of the likelihood of future financial crises (Magdalena et al., 2021). There are two categories of factors that might influence a bank's profitability: those that are internal and external to the bank. Return on assets (ROA), return on equity (ROE), and net interest margin (NIM) are often used in

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empirical research to evaluate the profitability of banks (Tan, 2018). A bank's ability to generate profits from its asset management activities while minimizing variations attributable to changes in capital structure is measured by its return on assets (Kohlscheen et al., 2018). Many variables affect a bank's profitability. These factors may be associated with a bank's management as a whole, including its capital structure, liquidity, credit risk, loan portfolio, expense, and product or service diversity. For example, the rate of economic development, industry regulation and supervision, inflation, financial deepening, and physical and financial policies are all examples of external variables that might affect the banking sector (Rao & Tekeste, 2012).

2.1.2 CAMEL Approach

The acronym CAMEL refers to the criteria that serve as the foundation for the bank rating system. Scholars frequently utilise the CAMEL framework to stand in for the more institution-specific elements (Dang, 2011). Capital sufficiency, asset quality, managerial effectiveness, profits, and liquidity are all important factors. This grading system assigns letter grades to banks based on how well they perform in these areas. These elements' vitality would be indicative of the bank's well-being. CAMEL approach as defined by Sahut and Mili (2011), say capital adequacy is a metric for assessing a bank's capacity to deal with risk associated with the market value of its assets. Instability in banking solvency is the result of non-performing loans' impact on the quality of assets held by banks. A bank's management is said to be effective if it can keep daily operations running smoothly despite the bank's financial woes. In order to support future expansion, a bank must be able to recoup some of the resources it has invested. Liquidity refers to a bank's capacity to fulfil short-term commitments.

2.1.2.1 Capital Adequacy

Financial stability is shown by a bank's Capital Adequacy Ratio (CAR), which is typically used as a measure of the bank's financial health. This ratio measures the bank's resilience in the face of operational risk, credit risk and other forms of risk. Capital is divided into two categories, the first of which is "Tire I" capital, which is made up of "core capital" or "own capital," largely made up of common stock, preferred stock, and retained profits. Tier II capital is an optional second layer of safety for financial institutions. Thus, Tier II Capital consists of unrevealed reserves, subordinate term loans, general provisions, and revaluation reserves (Christopoulos et al., 2011).

2.1.2.2 Assets Quality

The quality of a bank's assets is connected to the balance sheet's left side. In most banks, the top management cares most about the quality of the loans they make to consumers since it is what generates the most profit. The terms "asset quality" and "loan quality" are frequently interchanged despite having identical meanings. The cost to the bank and the bank's ability to achieve economies of scale are both impacted by the quality of the assets they hold (Yang & Gan, 2019). The two primary reasons for bank collapse are insufficient liquidity and poor asset quality. High levels of bad loans and widespread insider lending are major causes of the failure of many financial firms (Samuel, 2018; Aspal & Dhawan, 2016). One of the things that might compromise a bank's stability is credit risk. A bank's exposure to credit risk is proportional to the quality of its asset portfolio (Yang & Gan, 2019). A bank's asset quality is influenced by the risks it is exposed to, the rate at which its non-performing loans are increasing or decreasing, and the financial stability of its borrowers.

2.1.2.3 Managerial

The technical prowess, breadth of experience, and depth of knowledge amassed over many years that make up the bank's executive staff are all huge strengths that guarantee the bank's continued success. Because of this, it is accurate to say that a company's fortunes rise and fall on the shoulders of the skill of its management team in overseeing the smooth running of its business operations. It follows that successful businesses enjoy the fruits of quality management's labours (Gautam, 2020).

2.1.2.4 Earnings

Silim argues that in order to survive for a long time, provide value to their shareholders, and maintain and grow their capital, banks need to generate sufficient profits (Silim, 2021). Given that a bank's ability to continue its current and future operations is directly tied to the quality of its revenues and profitability, a wealthy bank should be able to generate sufficient profits to ensure the continued health of the bank and its investors. Two popular measures of a business's profitability are its Return on Assets and Return on Equity. A company's ROI may be calculated as their net profit divided by their total assets. Return on assets (ROA) is a measure of a bank's profitability that eliminates the impact of one-time events on the bank's financial results. Return on equity (ROE) is determined by dividing a company's net income by its total capital. The efficiency with which a bank employs its capital is measured by this ratio (Christopoulos et al., 2011).

2.1.2.5 Liquidity

Liquidity refers to the speed and convenience with which a bank's assets may be sold for their current market worth or in an emergency. In the event of a financial crisis requiring a quick injection of capital, a bank may react quickly because to this asset's

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feature. Kontu and Mihanovi (2019) explored the amount, timing, and cost as determinants of liquidity. Maintaining a sizable cash reserve means forgoing potential investments with greater returns. Banks may raise their returns by switching their investments from short-term to long-term securities or loans, but at the cost of taking on more liquidity risk. This means that banks with a high liquidity ratio are safer and less profitable. Financial liquidity ratios are used to determine a company's liquidity. While several ratios may be used to assess a company's liquidity, we employ only two in our CAMELS-based analysis. Total Loans/Total Deposits (L1) and Circulating Assets/Total Assets (CA/TA) are the ratios in question (L2) (Bar & Zeb, 2011).

2.2 Theoretical Review

This section discusses the theoretical underpinnings of the study. In effect, relevant theories bothering on influencing factors of profitability were reviewed. The theories reviewed in this context are trade-off theory and pecking order theory. These theories are reviewed in great depth in subsections 2.2.1 and 2.2.2.

2.2.1 Trade-off theory

Myers was the first to introduce the term "trade-off theory" to express the tax-bankruptcy perspective in 1984. Capital structure theorists propose that a company's optimal amount of leverage may be determined by balancing the tax benefits of debt with the costs of bankruptcy. In addition, the optimal level of debt is the point at which the marginal benefit of debt (tax deductibility of interest payments) is equal to the marginal cost of debt (growing default risk). Changes in leverage over time and variation in leverage across firms may be explained by shifts in the marginal interest tax shield and/or the marginal cost of default, according to this idea. Conventional interpretations of the tradeoff theory have predicted that more successful enterprises

will have greater leverage ratios. However, the actual evidence suggests the opposite: that more profitable firms will have lower leverage ratios (Zuhroh, 2019). The primary goal of every business is to maximise its value by determining the ideal debt ratio, which may involve exchanging some of the firm's equity for debt. To achieve the best possible financial standing, it is necessary to strike a balance between the many advantages and disadvantages of using debt financing, as described by trade-off theory. Decreased discretionary cash flow is another disciplining effect of debt (Gansuwan & Onel, 2012). The tax exemption is a significant part of the idea as well. By reducing their taxable revenue, companies may save more on their interest payments on loans. Increasing their debt loads is one strategy some businesses employ to get the most out of their tax exemptions. The tradeoff theory predicts that a company's profitability will increase if it makes full use of the tax benefits provided by debt, as stated by Niu (2008). However, as Gangeni (2010) explains in his research, there is a limit to how much a company may borrow because the actual cost of debt reduces profitability, which in turn lessens the efficiency of the tax shield. The Theory of the Firm predicts that a company's performance will have a beneficial effect on its long-term debt since more profitable businesses pose less of a risk to their debt holders and can afford to take on more debt.

2.2.3 Pecking Order Theory

The theory, developed by Stewart Myers and Nicolas Majluf in 1984, asserts that managers analyse financial sources in a hierarchy. The corporate debt ratio is expected to indicate a hierarchy of funding sources, with internal finance taking precedence over debt and debt taking precedence over equity. According to the Peking Order Theory, which posits that the cost of financing increases with asymmetric knowledge (Ansong & Ekow-Asmah, 2013). Financing from the inside is

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preferable because it is less susceptible to the adverse selection issue, which occurs when asymmetric knowledge is used to one's advantage. The stock is the least desirable because investors assume that management who issue additional equity do so because they believe the business is overpriced and wish to capitalise on this belief. As a result, the price of a company's stock usually falls when an equity issue is made. Board confidence in an investment's profitability and share price make debt issuance preferable to equity (Vasiliou et al., 2009). The Pecking Order Theory predicts that a firm's profitability will have a negative influence on its long-term debt as better profitability shows the firm's funds are adequate to satisfy the financing need.

2.3 Empirical review

2.3.1 CAMEL framework on the profitability of commercial banks

Saif-Alyousfi et al. (2017) evaluated Saudi bank profitability from 2000 to 2014 using a pooled ordinary least square and fixed effect model. Local banks are more profitable than foreign banks, according to the report. Banks, both domestic and international, with greater capital are more successful. Non-performing loan ratios at foreign banks are higher because of the greater credit risk they assume. As opposed to domestic banks, international banks have far higher operational costs to total income ratios, which is inversely connected to profitability. Therefore, the findings also show that bigger institutions are less profitable.

Kaur et al. (2015) analysed the monetary performance of a few chosen Indian public sector banks between 2009 and 2014 using the CAMEL Method. Bank of Baroda ranked highest across the board for CAMEL metrics; Puchab International Bank ranked second for Capital Adequacy, Management Efficiency, and Earning Capacity; the Bank of India ranked third for Asset Quality; and the State Bank of India ranked

dead last despite having the most assets and reserves. Similarly, Alemu and Aweke (2017) found that of the six private commercial banks in Ethiopia, WEGAGEN and NIB banks had the highest capital adequacy characteristics, followed by UB Bank and, DB Bank was rated worst.

When analyzing what variables influence bank profitability in Nigeria, Echekoba et al. (2014) used the CAMEL model. Liquidity was shown to be the most important factor in the profitability of Nigerian commercial banks, whereas capital adequacy, asset quality, management effectiveness, and profits had little influence in the banks' success over the study's time period (2001-2010).

Abate and Mesfin (2019) analysed nine commercial banks in Ethiopia from 2007 to 2016 using internal, external, and macroeconomic variables. For that purpose, a quantitative research strategy was used, and 9 commercial banks were randomly chosen from a pool of 18 in Ethiopia. The raw data acquired through audited financial accounts was analysed using a random effect regression model. Banks' profits are positively related to their levels of capital, leverage, liquidity, and ownership, as shown by the study's findings.

Siva and Natarjan (2011) studied CAMEL's impact on SBI Groups' performance. CAMEL scanning helps banks diagnose their financial situation and alerts them to take precautionary actions to guarantee their sustainability.

Supiyadi et al. (2019) analysed the factors, both internal and external, that have contributed to the growth of Indonesia's sharia banks from 2010 to 2017. ROI was used to measure bank profitability based on internal and external factors. External influences affect profitability. Bank liquidity had a significant positive impact on bank

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profitability, whereas internal characteristics like capital adequacy, credit risk, and asset size have a large negative effect. Sharia banks would have a competitive edge over traditional banks because they might enhance liquidity, strengthen their capital structure, decrease their assets, and cut their credit risk in anticipation of external circumstances.

Magoma et al. (2021) analysed Tanzania's biggest financial institutions, the NMB and CRDB. Fixed Effect Panel Regression in SPSS version 23 was used to investigate the relationship between CAMEL characteristics and banks' ROE. Commercial banks in Tanzania are impacted by profitability and liquidity. Inconsistent effects from the other three components on ROE, a common indicator of financial health.

Shukla et al. (2013) study rural bank characteristics and commercial bank profitability. The study used 1971-72-to-2011-2012 time series data. According to their findings, the percentage of bank branches located in rural areas grew between 1971–1972 and 1990–1991 but has since decreased as a result of a policy change from branch growth to consolidation in rural banking. The report found that for every 100 rupees brought in through deposits, only 60 were distributed as credits to the agricultural sector. This shows that non-performing assets should be reduced and loan supply should be individualised.

Getahun (2015) investigated 14 Ethiopian commercial banks using the CAMEL criteria and found that capital adequacy, asset quality, and managerial efficiency all had negative connections with both measures of profitability, whereas profits and liquidity showed positive associations. Eric et al. (2017) discovered that a bank's asset quality influences profitability and performance. In conclusion, asset quality influences banks' ROA. Financial success is measured by ROI, ROE, and NIM.

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Assfaw (2018) found that asset quality, earning capabilities, and bank size impact Ethiopian private banks' financial performance. Management at the banks should therefore concentrate on bolstering the aforementioned major factors.

Javaid et al. (2011) studied the top 10 banks in Pakistan's 2004-2008 profitability. Only internal issues mattered to them. Javaid et al. (2011) used the pooled ordinary least square (POLS) technique to examine the impact of assets, loans, equity, and deposits on banks' return on assets (ROA). Empirical study shows that these elements affect a firm's profitability. Due to diseconomies of scale, a bigger total asset value does not always lead to a higher profit level.

Jha and Hui (2012) used the CAMEL model to compare Nepalese commercial banks' financial performance. Capital adequacy, non-performing loan, interest expenses to total loan, net interest margin, and credit-to-deposit ratios were used in regression models to forecast financial performance (ROA and ROE). Return on assets (ROA) was influenced by capital adequacy ratio, interest expenses to total loan, and net interest margin, while ROE was impacted by capital adequacy ratio. Capital adequacy ratio, interest cost to total loan, and net interest margin affected return on assets (ROA), whereas capital adequacy ratio affected return on equity (ROE).

Capital sufficiency, managerial quality, and asset quality were found to be the most important factors in Bastan et al (2016)'s evaluation of Iranian financial institutions. Contrarily, Kandel's (2019) study discovered that the asset quality ratio, earning potential, and liquidity are the major determinants of a bank's financial success. In addition, Ferrouhi (2014) used a camel approach to examine the success of key Moroccan financial institutions between 2001 and 2011. According to his findings, all six banks profited within the study's time frame. His research, based on a weighted

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average of the relevant ratios, revealed that certain financial institutions fared better than others.

The CAMEL model was used by Khanifar et al. (2016) to research and compare the financial performance of public and private business banks from 2006 to 2009. Eight commercial banks were chosen for the study's statistical sample (4 public and 4 private) using a judgmental selection strategy. According to the findings, private banks performed better than government banks in terms of liquidity and profits, and there was no discernible difference between the two in terms of overall performance.

Using the CAMEL framework, Nguyen et al. (2020) analyze the financial outcomes for commercial banks in Vietnam. The "CAMEL" indicators of capital adequacy, asset quality, management effectiveness, and bank liquidity are the independent variables in three econometric models, while the financial performance of commercial banks is represented by return on assets (ROA), return on equity (ROE), and net interest margin (NIM) ("dependent variables"). Thirty-one Vietnamese commercial banks were included in the study's sample throughout a six-year time period, from 2013 to 2018. According to the data, the fixed effects model (FEM) is superior to the ordinary least squares (OLS) and the random effects models (REM). Results for Vietnamese commercial banks were shown to be influenced by factors like capital sufficiency, asset quality, liquidity, and managerial efficiency.

Kumarasinghe and Jahfer (2021) analysed the financial standing of licensed commercial banks in Sri Lanka from 2010 to 2019. This applies to both public and commercial financial institutions. The CAMEL methodology was used to assess financial institution performance using return on assets as the dependent variable and capital sufficiency, asset quality, management quality, earnings capacity, and liquidity

condition as the independent variables. Capital adequacy and liquidity position were shown to positively correlate with the financial performance of commercial banks in Sri Lanka throughout the study period, however other factors failed to demonstrate a meaningful association.

Afroj (2022) analyses the financial stability of 35 different banks in Bangladesh from 2010 to 2015, along with the factors that have an impact on their stability. Panel regression was used in the second phase to identify the factors that contribute to a bank's health. Empirical evidence shows that Islamic banks in Bangladesh are more solvent and more productive than their conventional and Islamic window banking counterparts. Bank size, loan recovery, salary, and banking sector growth all have a favourable impact on the bank's financial health in Bangladesh. However, loan assets have a negative impact.

2.3.2 CAMEL framework on the profitability of commercial banks by ownership.

Saif-Alyousfi et al. (2017) compared and contrasted the profitability of domestic and international banks. This research addresses that need by applying a pooled OLS and fixed effect model to analyse Saudi bank profitability according to CAMEL framework parameters from 2000-2014. The findings point to domestic financial institutions as being more lucrative than their international counterparts. The study's authors also found that local and foreign banks with higher capital fared better. The profitability of a bank decreases as the percentage of nonperforming loans rises, and the credit risk of an international bank increases. They also found that the substantial increase in lending activities has helped local banks' bottom lines while having a detrimental effect on the multinational banks' profits in the country.

Kumari (2017) used CAMEL ratings to analyze the financial performance of multinational commercial banks operating in Sri Lanka from 2008 to 2014. It was found that international banks perform well in terms of capital adequacy and profitability but marginally in other areas.

Macroeconomic variables do not affect return on equity (ROE), but loan loss provision, bank size, and leverage ratio do. Robin et al. (2018) and Yesmine and Bhuiyah (2017) found that capital ratio, asset quality, and bank size impact performance. Where the ownership type has a negative impact, capital to assets ratios and bank size have positive ones, and vice versa. It demonstrates that Bangladesh's private banks are more competent than its governmental banks.

Gupta and Mahakud (2020) assess institutional, industry, and macroeconomic variables on India's commercial banks. Gupta and Mahakud (2020) evaluate the impact of bank size, capital ratio, risk, cost-to-income ratio, financing cost, revenue diversification, labor productivity, and age on bank performance. Private Banks are more profitable than public sector banks.

The CAMEL grading method was used by Mishra et al. (2013) to examine the effectiveness of private and public banks in India from 2000-2011. Based on their findings, it was determined that private sector banks are at the top of the list with their performance. The earlier study, on the other hand, attempted to quantify the efficiency change of those selected banks between 2010 and 2012 using a frontier-based non-parametric approach called Data Envelopment Analysis (DEA).

Moon (2018) studied the performance of the Malaysian banking sector from 2013 to 2017 using the CAMEL framework and standard accounting indicators of ROA, ROE, and economic value added (EVA). While liquidity didn't affect any models, the CAMEL factors did affect ROA, ROE, and EVA.

Suvita and Xiaofeng (2012) evaluate the performance of commercial banks in Nepal with various ownership arrangements to identify success drivers. Eighteen commercial banks' financial data from 2005-2010 was analyzed. Public sector banks are less effective than private sector banks, whereas private domestic banks are on par with foreign-owned (JV) rivals. Capital adequacy ratio, interest expenses to total loan, and net interest margin all have a large influence on return on assets, whereas capital adequacy ratio impacts return on equity.

Foreign banks frequently contribute superior know-how and technical competence, according to Olwen and Shipho (2011). They boost financial system stability by drawing on local banks' liquidity and giving access to global markets. They also raise competitive pressure on local banks, which improves financial intermediation. Nachum and Ogbechie (2019) propose that foreign-owned banks are more profitable in emerging nations than their indigenous equivalents and less profitable in industrial countries. Domestic banks have an advantage over foreign banks owing to their local market understanding.

2.4 Conceptual Framework

According to the CAMEL framework, the five components evaluate total bank performance from different viewpoints that are directly related to bank profitability. First of all, capital adequacy (CA) evaluates the bank's ability to sustain its current level of commercial activity and grow its operations. The asset quality (AQ) metric is

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used to evaluate the potential impact on the bank's loan loss provision of assets held or acquired by the bank. Management soundness (MS) entails the ability to run and manage the bank's operations with sufficient knowledge and skill, both of which might affect the bank's losses in a fraud case. The next metric to consider is the bank's earnings management (EM), which should reflect the return on assets and equity for the shareholders. Finally, we have the liquidity variable (LIQ), which assesses the bank's preparedness in terms of cash and short-term assets. As a result of the above, the factors in the CAMEL framework can impact banks' profitability as measured by return on assets (ROA), return on equity (ROE) and net interest margin (NIM).
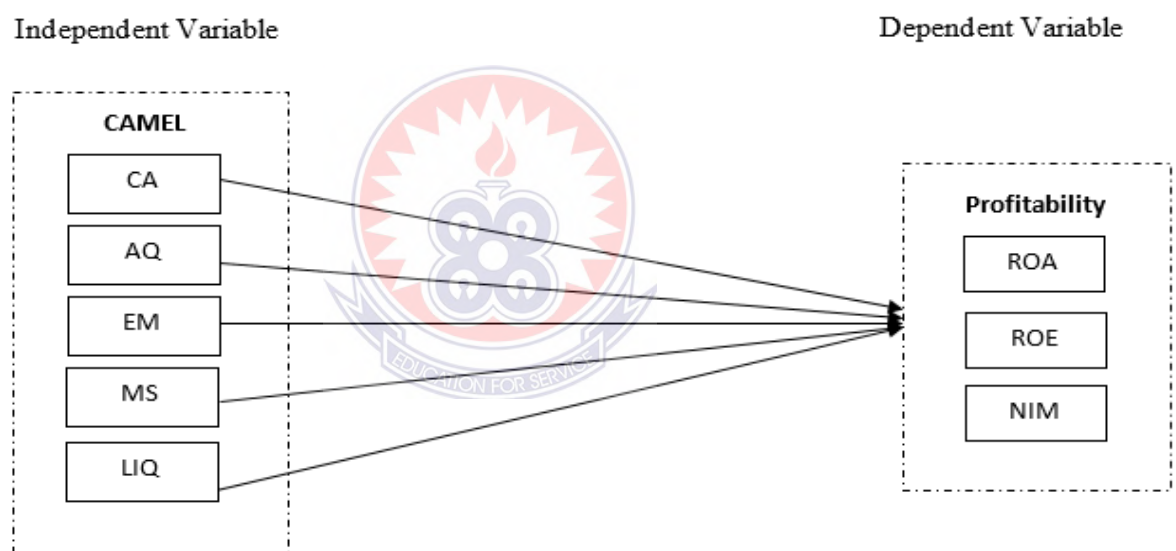
Figure 1: Conceptual framework

Source: Author's Construct (2023)

2.5 Summary

According to the studies presented in the aforementioned literature, some researchers have employed CAMEL components to evaluate the profitability of banks, however, the majority of researchers have relied on ROA as a representation of banks' financial health. Others assessed the bank's financial position in comparison to other banks.

The study was theoretically predicated on the trade-off theory and the pecking order theory. One way to gain a deeper understanding of the elements that contribute to the variations in profitability across different banks is to conduct a comparative analysis using the CAMEL approach. This research is carried out in response to a recent call for the necessity of conducting comparative study. The purpose of this research is to investigate how CAMEL affects the profitability of banks in Ghana.

CHAPTER THREE

RESEARCH METHODS

3.0 Introduction

The overriding purpose of this study is to use the CAMEL approach to investigate the factors that influence the profitability of commercial banks in Ghana and to distinguish the impacts by bank ownership. To achieve this aim, this chapter prescribes relevant research methods. In effect, the chapter stipulates the relevant research design, population, sample and sampling procedure, data collection instrument, data collection procedures and data processing and analysis.

3.1 Research Design

Research design is a blueprint that ideally provides linkage between the research questions and the information to be gathered and analysed (Yin, 2018). Research design can therefore be termed as a sequential blueprint on how planned research is to be carried out, operationalizing elements in a way that can be measured and how end results from the empirical test will be interpreted. The research design employed in this study was an explanatory also called causal research design. This design is most suitable for the study since the study's aim was to assess the impact of CAMEL on bank profitability-an evidence of cause-effect analysis which is the primary goal of an explanatory research design (Yin, 2018).

3.2 Research Approach

A research approach is a plan and procedure that consists of the steps of broad assumptions to detailed methods of data collection, analysis, and interpretation (Creswell, 2009). It is therefore based on the nature of the research problem being addressed. A research approach could be quantitative, qualitative or mixed approach

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(Jebreen, 2012). The study employed a quantitative approach. Quantitative research can be defined as a research approach that emphasizes quantification in data collection and analysis (Bryman & Bell, 2011). This approach of research mainly highlights the use of measurement to describe underlying phenomenon and relationships (Saunders et al., 2007). Quantitative research methods encompass survey modelling and statistical analysis (Nyame-Asiamah & Patel, 2009). Quantitative approach therefore systemically studies phenomena through mathematical calculations to confirm hypotheses constructed from theory (Saunders et al., 2007). This approach is most suitable since the study aims to use statistical models to test a hypothesis on whether or not CAMEL impacts bank profitability.

3.3 Population

Population is an entire group of individuals, events or elements who possess an interested characteristics (Weeks, 2020). This view was supported by Yin (2018) who asserted that a study's interested population is the number of respondents in the entire environment of interest to the researcher. The population of this study is all banks in Ghana. However, the study's target population is 23 BoG-registered 23 commercial banks (Bank of Ghana [BoG], 2022).

3.4 Sampling Procedure

A sample of a study refers to individual elements that are selected from the entire population to represent the population for the purposes of data collection is referred to as the samples (Babbie, 2010). Sampling is therefore the process of drawing the individual elements from the population to make up the sample for the purpose of data collection. This study employed a purposive sampling technique to draw 9 commercial banks out of the 23 commercial banks operating in Ghana. Purposive

sampling lets researchers choose participants depending on their attributes (Campbell et al., 2020). Nine (9) banks constitute the sample of the study on the basis that out of the 23 GoG-registered commercial banks, only 9 are listed on the Ghana Stock Exchange (Akomeah et al., 2020). According to Mugenda and Mugenda (1999), a sample size of between 10% and 30 % is a good representation of the target population, hence 39.13% of the study's population was appropriate for the study. For the purposes of anonymity, the banks were coded as B1, B2, B3, B4, B5, B6, B7, B8 and B9.

3.5 Data Collection Instrument

The study examined a 12-year panel financial data (ROA, ROE, NIM & CAMEL) of listed commercial banks from 2010 to 2021. This data is of course, a secondary data measured at the ratio level of measurement. The data was obtained using the published audited financial reports of these firms retrieved from the fact book of the Ghana Stock Exchange.
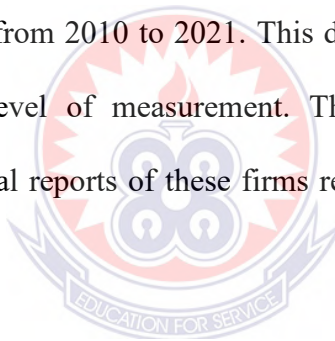
3.6. Data Collection Procedure

Since the study used a secondary data, the researcher accessed the website of Ghana Stock Exchange, identified and selected the banks for the study. A 12-year (2010-2021) financial report for each bank was downloaded after which each of the reports was perused to obtain the various data necessary for the analysis. Microsoft excel was then used to collect the relevant data for the analysis.

3.7 Data Processing and Analysis

Data was analysed using Stata version 16. Banks' profitability was analysed using descriptive and static panel regression.

The average mean score and standard deviations were used to summarize the data and analyze its journey (Garson, 2012). McNabb (2015) says academics may employ cumulative frequency distribution, histograms, box plots, frequency polygons, bar charts, pie charts, and scatter diagrams to convey research topics. This study's descriptive measures were minimum, maximum, mean, and standard deviation. Firm performance and corporate sustainability reporting are studied factors.

This research used static panel regression since the data was obtained from 2010 to 2021. Chen et al. (2002) define panel data as multidimensional, repeating observations. Static panel regression estimated cross-section-specific effects, temporal effects, or both to investigate unobserved heterogeneity. Pooled OLS variation, fixed effect, and random effect models are static panel data models (Hamiye et al., 2020). Pooled OLS (Ordinary Least Square) ignores data's time and individual dimensions. Fixed effects models consider individual differences. Random model removes biases from unobserved and changing factors (Hamiye et al., 2020). Hausman's specification test was employed to establish if the fixed or random effect was true.

These three estimations were used in this study to examine the factors that influence the profitability of the cross-section of banks in this study (Pooled OLS), determine the difference of these factors' effects among these banks (Fixed effects), and examine the degree to which these factors have affected the profitability of these banks over time (random effect). Also, the effectiveness of panel regression has been demonstrated in the studies by Bansal et al. (2018) and Abduh et al. (2017) who

examined the factors that influence profitability in Indian and Malaysian banks respectively.

3.8 Model specification

The study used a static panel regression model incorporating the pooled OLS model, fixed effect model, and random effect model. The models are given below;

$$ROE_{it} = \beta_{0i} + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 MS_{it} + \beta_4 L_{it} + \beta_5 E_{it}$$

$$+ \sum_{k=1}^{3} CONTROL_{i,t} + u_{i,t}$$

$$ROA_{it} = \beta_{0i} + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 MS_{it} + \beta_4 L_{it} + \beta_5 E_{it}$$

$$+ \sum_{k=1}^{3} CONTROL_{i,t} + u_{i,t}$$

$$NIM_{it} = \beta_{0i} + \beta_1 CA_{it} + \beta_2 AQ_{it} + \beta_3 MS_{it} + \beta_4 L_{it} + \beta_5 E_{it}$$

$$+ \sum_{k=1}^{3} CONTROL_{i,t} + u_{i,t}$$

where β0i is the y-intercept of bank i; ROE_{it}, ROA_{it}; NIM_{it} is the return on equity, return on asset and net income margin of each bank i at time t; CA_{it} is the capital adequacy ratio of bank i at time t; AQ_{it} is the asset quality of bank i at time t; MS_{it} is the management soundness of bank i at time t; L_{it} is the liquidity of bank i at time t; E_{it} is the earning management of bank i at time t and $u_{i,t}$ the error term of bank i at time t or between bank's error.

3.9 Diagnostic test

The research used diagnostic tests to verify data was suitable for static panel regression. This research employed Hausman, multicollinearity, unit root, and serial correlation tests.

3.9.1 Hausman Test

Hausman's (1978) test compared RE and FE estimators by comparing random- and fixed-effect models. The Durbin-Wu-Hausman test compares two estimators, one of which is presumed to be more accurate. This exam evaluates empirical and theoretical facts. In panel regression, this method is used to clarify the relationship between dependent and independent variables by comparing random and fixed effects.

3.9.2 Multicollinearity test

Multicollinearity develops when numerous independent variables have high relationships (Daoud, 2017). Multicollinearity may lead to a skewed or misleading outcome when trying to forecast or gain insight into a dependent variable in a statistical model. Variance of the Inflation Factor (VIF) was employed in this study. The variance inflation factor (VIF) measures how linearly connected predictor variables inflate regression coefficient variance. 1 shows no association, 2–5 moderate correlation, and 6–10 great correlation (Kim, 2019).

3.9.3 Unit root

This investigation made use of a time-series data set. Time series data are notoriously prone to stationarity, as stated by (Clements & Hendry, 2001). Caused by the failure of a temporal shift to induce a corresponding shift in distribution. Panel data analysis relies on the stationarity of the data series to draw conclusions and improve the quality of the resulting models. A data series is stable if its mean and variance are

constant across time and if the covariance between the two extreme periods relies solely on the lag and not the actual time (Dewoody et al., 2006). The series' integrated level was determined using Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979; Phillips & Perron,1988; Kwiatkowski et al., 1992).

3.9.4 Test for serial correlation

Panel regression assumes variable independence. However, serial correlation occurs when variables are correlated in a specific order. Due to serial correlation between variables, ordinary least square model-derived regression estimates are still unbiased but inefficient. We used Durbin Waston Testing to check for serial correlation in the data. Autocorrelation in statistical model residuals can be quantified using the Durbin-Watson statistic. Always, Durbin-Watson's statistics lie between zero and four. Sample uncorrelation is indicated by a score of two, positive autocorrelation by values between minus two and plus four, and negative autocorrelation by values between minus four and plus two.
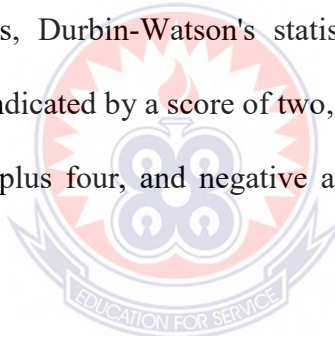
3.10 Variable description and measurement

There were three variables in this study. Dependent (profitability) and independent (CAMEL) and control variables (firm size. Ownership and firm age). Below are the proxies used to measure profitability and CAMEL. All variables were obtained from the financial report (FR) of listed manufacturing firms.

Table 1: Variables descriptive and measurement

Variable	Measurement/formula	References	Expected sign
Dependent (firm performance)			
ROA	net profits divided by total assets of a firm i at time t	Sivalingam, and Kengatharan, (2018)	
ROE	net profits divided by shareholder equity of a firm i at time t	Sivalingam, and Kengatharan (2018)	
NIM	Net interest income to total assets	Kirimi, Kariuki, and Ocharo, (2022)	
Independent variable			
Capital adequacy	Capital to Assets = Equity Capital & Reserves/Total Assets	Saeed, Shahid, and Tirmizi, (2020)	+/-
Asset quality	NPLs to Gross advances = Total NPLs/Total Loans (gross)	Saeed, Shahid, and Tirmizi, (2020)	+/-
Management soundness	Operating Expenses to Total Assets=Non-markup Expenses (operating)/Total Assets	Saeed, Shahid, and Tirmizi, (2020)	+/-
Earning management	Interest income to total assets	Kirimi, Kariuki, and Ocharo, (2022)	+/-
Liquidity	Loans to Deposits = Gross Advances (or Loans)/Borrowing and Deposits	Saeed, Shahid, and Tirmizi, (2020)	+/-
Control variables			
Firm size	Natural log of the firm's total asset	Drempetic, Klein, and Zwergel, (2020)	+/-
Type of Ownership	Dummy variable 0" Local firms" 1" foreign firms"		+/-
Firm age	How long has the firm been listed	Ali, Hameedi, and Almagtome, (2019)	+/-

3.11 Summary of Chapter

This research examined commercial bank profitability. This analysis chose Ghanaian commercial banks with accessible financial reports. Profitability and independence data were extracted (CAMEL). NIM, ROA, and ROE measure profitability. Model controls included company size, age, and ownership structure. Using a panel research methodology and a positivist perspective, data was gathered from commercial bank financial reports. Static panel regression was used to determine profitability variables.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The purpose of this study is to use the CAMEL approach to investigate the factors that influence the profitability of commercial banks in Ghana and to distinguish the impacts by bank ownership. To achieve this aim, a 12-year (2010-2021) financial data (ROA, ROE, NIM & CAMEL) from nine (9) Ghanaian listed commercial banks selected through purposive sampling technique was used. Data was analysed using descriptive statistics (Mean, Standard deviation and coefficient of variation) and static panel regression analytical techniques (pooled OLS and random effect models).

4.2 Descriptive Analysis

This section primarily describes the profile of data collected from the perspectives of averages and deviations. In effect, mean, standard deviations and coefficient of variation were used in achieving this aim. The descriptive results are presented in Table 4.

Table 2: Descriptive Analysis

Variables	Mean	SD	CV	No.Obs.
ROA	2.143	0.303	0.1413	108
ROE	1.290	0.289	0.2240	108
NIM	30.717	3.068	0.0998	108
CA	15.738	6.297	0.0017	108
AQ	0.368	0.035	0.0951	108
EM	0.539	0.483	0.8961	108
MS	4.210	0.499	2.3764	108
LIQ	0.738	0.408	0.5528	108
OWN	0.282	0.460	1.6312	108
FA	15.731	0.246	0.0156	108
SIZE	9.825	0.746	0.0759	108

Source: Authors Computation (2022); *NB where ROA, ROE, and NIM are the return on equity, return on asset and net income margin, CA is the capital adequacy ratio, AQ is the asset quality MS is the management soundness, LIQ is the liquidity, EM is the earning management, OWN is the ownership type, SIZE is the bank size, and FA is the bank age*

Descriptive statistics allow data to be summarized by frequency and proportion. Descriptive statistics provide researchers confidence and insight into their raw data using frequency and percentage distributions (Garson, 2012). It was posited that researchers may use histograms, box plots, frequency polygons, bar charts, pie charts, and scatter diagrams to explain their investigations. This study used central tendency metrics (mean, standard deviation, coefficient of variation) to categorize variables. Mean values describe raw data, while standard deviation demonstrates how effectively they reflect data (Field, 2009).

High coefficient of variation implies explanation dispersion. According to the analysis, ME had a mean of 0.539 and standard deviation of 0.483, and MS had m=4.210 and SD=0.499, indicating that the operating profit to net income ratio is a key indicator of the bank's profitability, especially in terms of cost control (Aldasoro et al., 2020; Ihsan & Hosen, 2021; Ferdinandus, 2020, Nguyen et al., 2022). High operational profit margins indicate a low-cost operating style, effective cost management, and rising bank revenues over expenses. LIQ reported to have m=0.738 and SD=0.408 implies that the total loan deposit ratio is over 73%. Additionally, whereas AQ was reported to have m=0.368 and SD=0.035, CA saw m=15.738 and SD=6.297. Finally, ROE, ROA and NIM are all non-negative.

4.3 Correlation Analysis

Correlation links dependent and independent factors. It searches for multicollinearity among the study's independent variables. Table 4.2 summarizes correlations for financial performance factors. Correlation measures the intensity and direction of two variables' relationship. Absolute coefficient indices reflect the magnitude of the relationship between variables, while the sign (positive or negative) denotes the

direction. The correlation matrix shows independent variable multicollinearity. When the independent variables are strongly related (r=0.9 or higher), it's hard to separate their influence on the dependent variable.

Table 3: Correlation Matrix

S/N	Variables	1	2	3	4	5	6	7	8	9	10	11
1	ROA	1										
2	ROE	0.2949*	1									
3	NIM	0.1939*	0.0982*	1								
4	CA	0.0280	0.2640*	-0.0394	1							
5	AQ	0.1803*	0.0994*	0.0890*	0.0342	1						
6	EM	0.0438*	0.0928	0.0399	0.0499*	-0.0939	1					
7	MS	0.0440*	0.0442*	0.0209	0.0299*	0.5214*	0.2820*	1				
8	LIQ	0.0030	0.0473*	0.0579*	0.9904*	0.9942*	0.0594*	0.035***	1			
9	OWN	0449*	0.091*	0.0298	0.3949*	0.2839	.0489*	0.052***	0.4781*	1		
10	FA	0.9839*	0.022***	0.2035*	0.0922	0.0342	0.5639	0.159***	0.0298*	0.1360*	1	
11	SIZE	-0.049*	0.035***	0.0248	0.0240	0.0334	0.3709*	0.054***	0.1442*	0.1809*	-0.0398	1

Source: Authors Computation (2022); *NB where ROA, ROE, and NIM are the return on equity, return on asset and net income margin, CA is the capital adequacy ratio, AQ is the asset quality MS is the management soundness, LIQ is the liquidity, EM is the earning management, OWN is the ownership type, SIZE is the bank size, and FA is the bank age*

Notably, as expected, return on assets is positively correlated with (Earning management, Management soundness, Asset quality, Type of Ownership, and Firm Age) which is statistically significant at the 10% level. However, Liquidity and Capital adequacy are positively correlated with return on assets but statistically insignificant. Furthermore, the correlation matrix identified the potential multicollinearity of independent variables. In a circumstance in which the independent variables are strongly linked (r=0.9 or more) such that it is impossible to disentangle the effects of the independent on the dependent variable. In other words, one of the predictor variables may be predicted with near-perfect accuracy by another predictor variable. This implies that low collinearity between independent variables means that the (Earning management, Management soundness, Asset quality, Type of Ownership, Firm Age, Firm Size, Liquidity, and Capital adequacy) do not influence each other in the impact on the financial performance resulting in the independence of the variables.
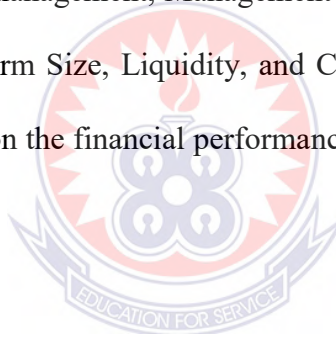
4.4 Diagnostics Test

First, it was determined if the model needed a fixed or random effect. Table 4.3 shows the Hausman test and chi-square results. Random effect is the null hypothesis, whereas fixed effect is the alternative. 0.6819 chi-square and 14.875 p-value. Random effect model was utilized.

Before the model is estimated, a diagnostic analysis was done to determine the appropriateness and robustness. Table 4.3 summarizes assumptions required for a panel regression study to determine the influence of capital structure on financial performance with regulation as a moderator. The table shows pre- and post-diagnostics. The Levin-Lin-Chu Unit-Root Assess was used to test panel data

stationarity. Before modeling, this was needed. Levin-Lin-Chu Unit-Root Test null hypothesis is non-stationarity. The results of the test indicate that the variables included in the panel data are stationary at a 5% level of significance (Z=-1.4584, p-value=0.0276).

Table 4: Diagnostic Test

Fixed-Random Effect Hausman Test		Heteroscedasticity studentized Breusch-Pagan test		Panel Unit Root Test Levin-Lin-Chu Unit-Root Test	
P-value	14.875	BP	17.620	Z	1.4584
Chi-square	0.6819	P-value	0.7251	P-value	0.0276

Source: Authors Computation (2022)

By considering the heteroscedasticity of the regression model using the studentized Breusch-Pagan test one can see that the residual analysis shows a constant variance of the error. This is because the studentized Breusch-Pagan test has the null hypothesis as errors are constant (homoscedasticity of error), and the resulting p-value of 0.7251 was greater than 0.05. Thus, the model presented was robust for the analysis.

4.5 Regression Results

The study employs static panel estimating techniques to get a rough estimate of the model. In the beginning, the model is estimated using cross-section pooled OLSAll coefficients have anticipated signs, and most are significant at 1%. Most RE model coefficients are statistically significant at the 5% level or higher, and the computed results have the predicted indications. Both models are well-fitted, with R^2 values over 0.20, according to goodness-of-fit tests. The Breusch-Pagan LM test rejects the FE null hypothesis, demonstrating the RE model is more reliable than the cross-section pooled OLS. The Hausman test compares RE and FE models directly. The

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data disprove the RE model's null hypothesis frequently. This study concludes that the RE model yields more reliable results. The diagnostic tests all show that the FE model was incorrectly selected. In particular, the residuals are serially correlated and the error variance is unequal.

Table 5: Pooled OLS Estimates

Variables	Model 1 (ROA)	Model 2 (ROE)	Model 3 (NIM)
Constant	0.0248** (0.0124)	−0.0477*** (0.0132)	0.0802* (0.0416)
CA	0.0274** (0.012)	−0.0296*** (0.00621)	0.0468* (0.0244
AQ	0.0502** (0.0211)	0.0413*** (0.0028	-0.0327* (0.0177
EM	0.0186*** (0.0063)	0.0671*** (0.0199	0.0260** (0.0103
MS	−0.0477*** (0.0132)	0.0167** (0.0082)	−0.100*** (0.0169
LIQ	0.0477*** (0.0132)	0.0120*** (0.0032)	0.0150 (0.0428
OWN	0.0609** (0.0289)	−0.0439** (0.0161	0.0167** (0.0078
FA	-0.0477** (0.0187	0.0411** (0.0251	0.0609** (0.0284)
SIZE	0.0383** (0.0152	−0.0391*** (0.0109)	-0.0477*** (0.0184
R-square	0.339	0.381	0.259

Source: Authors Computation (2022); *NB where ROA, ROE, and NIM are the return on equity, return on asset and net income margin, CA is the capital adequacy ratio, AQ is the asset quality MS is the management soundness, LIQ is the liquidity, EM is the earning management, OWN is the ownership type, SIZE is the bank size, and FA is the bank age*

Model 1 shows that return on assets positively affects CAMEL (Capital adequacy, Asset quality, Liquidity, and earning management) by 1%, 5%, and 10%. ROA negatively affects management soundness, according (Saeed et al., 2020). The research offers three control factors that positively affect ROA: company age, size, and ownership type. Model 2 shows that ROE positively affects CAMEL (Asset quality, Management soundness, and Liquidity). Capital adequacy reduces ROE (Sivalingam & Kengatharan, 2018). Liquidity, Capital sufficiency, and Earnings Management have a favorable influence on NIM, whereas Asset Quality and Management Soundness have a negative effect (Kirimi et al., 2022; Christopoulos et al., 2011).

Table 6: Random Effect Estimates

Variables	Model 1 (ROA)	Model 2 (ROE)	Model 3 (NIM)
Constant	0.267*** (0.0623)	0.340*** (0.0676)	163*** (0.0211)
CA	0.0131*** (0.0034	0.0758* (0.0426)	0.0248** (0.0124)
AQ	0.0186*** (0.0063)	0.0299*** (0.0084)	0.0221*** (0.0049)
EM	0.0446 (0.2110)	0.0443 (0.0328)	0.0334*** (0.0069
MS	0.0206*** (0.0064	0.0301*** (0.0082)	0.0170 (0.0141)
LIQ	−0.0254*** (0.0067)	−0.0295*** (0.0079)	0.0274** (0.0129)
OWN	0.0335* (0.0188)	−0.0179** (0.0075	−0.0183*** (0.0063)
FA	0.267*** (0.062)	0.0345*** (0.0022	0.239*** (0.0719)
SIZE	−0.0296*** (0.00621)	−0.0532 (0.0929)	0.0231** (0.0098)
R-square	0.361	0.286	0.482

Source: Authors Computation (2022); *NB where ROA, ROE, and NIM are the return on equity, return on asset and net income margin, CA is the capital adequacy ratio, AQ is the asset quality MS is the management soundness, LIQ is the liquidity, EM is the earning management, OWN is the ownership type, SIZE is the bank size, and FA is the bank age*

Model 1 shows that CAMEL (Capital adequacy, Asset quality, Management soundness and earning management) has a positive and statistically significant influence on return on assets. However, liquidity reduces ROA (Yang & Gan, 2019). The research offers three control factors that positively affect ROA: company age, size, and ownership type. Model 2 shows that ROE positively affects CAMEL (Capital adequacy, Asset quality, Management soundness, and earning management). Liquidity hurts ROE, per (Sivalingam & Kengatharan, 2018; Yang and Gan, 2019). Model 3 empirical data show that liquidity, capital adequacy, asset quality, management soundness, and earning management positively affect NIM (Laeven et al., 2014).

Table 7: Random Effect Estimates (Ownership Type)

	Local Banks				Foreign Banks		
Variables	Model 1 (ROA)	Model 2 (ROE)	Model 3 (NIM)	Variables	Model 1 (ROA)	Model 2 (ROE)	Model 3 (NIM)
Constant	0.196*** (0.0632	0.340*** (0.0676	0.236*** (0.0601	Constant	0.0254** (0.0091)	0.0116* (0.0065)	0.0682** (0.0325
CA	0.0190** (0.0077	0.0301*** (0.0082	0.0201*** (0.0064)	CA	0.0518** (0.0248	0.0520** (0.0254	0.0651*** (0.0240)
AQ	−0.0151** (0.0077)	-0.0295*** (0.0079	−0.0256*** (0.0063)	AQ	−0.0457** (0.0182)	-0.0358** (0.0180	−0.0290** (0.0132
EM	-0.0206 (0.0228)	−0.0556 (0.2205)	−0.0123 (0.0198)	EM	0.0383** (0.0146)	.0235* (0.0138	0.0271* (0.0155)
MS	−0.0181 (0.2119)	0.0443 (0.0328)	0.0344 (0.1110)	MS	−0.0208** (0.0089)	-0.0532*** (0.0117)	-0.0299** (0.0118)
LIQ	0.267*** (0.062)	0.310*** (0.0296)	0.249*** (0.0627	LIQ	0.0161*** (0.0047	0.0540 (0.0441	0.0724** (0.0269)
OWN	0.0206*** (0.0064)	0.239*** (0.0719)	0.0249*** (0.0073)	OWN	0.0373** (0.0186	0.0335* (0.0188	0.0608*** (0.0211)
FA	-0.0254*** (0.0067)	0.0212*** (0.0073	0.0257*** (0.0069	FA	0.0131*** (0.0034)	0.0541*** (0.0039	0.0103** (0.0044
SIZE	-0.0162 (0.0198)	0.0214** (0.0091)	−0.0715 (0.2104	SIZE	0.0158*** (0.0048	0.0201*** (0.0071	0.0145** (0.0055

Source: Authors Computation (2022); *NB where ROA, ROE, and NIM are the return on equity, return on asset and net income margin, CA is the capital adequacy ratio, AQ is the asset quality MS is the management soundness, LIQ is the liquidity, EM is the earning management, OWN is the ownership type, SIZE is the bank size, and FA is the bank age*

4.5.1 Results

In model 1, CAMEL (Capital adequacy and Liquidity) has a statistically significant positive influence on return on assets. However, management soundness, earnings management, and asset quality consistency hurt ROA (Ferdinandus, 2020, Nguyen et al., 2022). Model 2 shows that CAMEL (earnings management, Capital adequacy, and Liquidity) positively affects ROE. Management soundness and asset quality reduce ROE (Ferdinandus, 2020, and Nguyen et al., 2022). Liquidity, capital adequacy, and earning management have a positive influence on NIM, according to model 3. Asset quality and management soundness hurt NIM (Aldasoro et al., 2020; Ihsan Hosen, 2021). The foreign banks' ROA, NIM, and ROE have a statistically significant beneficial influence on the CAMEL framework (Capital adequacy, earnings management, and liquidity). However, ROA, ROE, and NIM negatively affect management and asset quality (Adugu et al., 2020; Akomeah et al., 2020; Ferdinandus, 2020, Nguyen et al., 2022).

4.6 Discussion

Using the Trade-off theory and the pecking order theory, we analyzed how the CAMEL framework affected the profitability of commercial banks in Ghana. What's more, the discussions were backed by the relevant literature.

4.6.1 The effect of the CAMEL framework on the profitability of commercial banks in Ghana.

Model 1 shows that return on assets positively affects CAMEL (Capital adequacy, Asset quality, Management soundness, and Earnings management). ROA hurts liquidity, per (Yang & Gan, 2019). The research provides three control variables (firm age, firm size, and ownership type) that positively affect ROA. Model 2 shows that

ROE positively affects CAMEL (Capital adequacy, Asset quality, Management soundness, and earning management). According to, liquidity hurts ROE (Sivalingam & Kengatharan, 2018; Yang & Gan, 2019). Liquidity, capital sufficiency, asset quality, management soundness, and earning management all have a positive influence on NIM, supporting the concept.

The results imply that the commercial banks' capitalization levels and capital bases are both healthy. Their capitalization is enough as per global grading standards. Maintaining or strengthening the CAR would help banks weather any shocks to their balance sheets. Any shocks to their balance sheets caused by the GFC were weathered by the CAR, which remained sufficiently resilient throughout the period. According to Basel II, financial institutions must have an Internal Capital Sufficiency Assessment Process (ICAAP) in place to assess the adequacy of their capital in light of the risks they face (Varaprasad & Rao, 2019). Basel III, on the other hand, seeks to improve the capital framework's risk coverage by, among other things, encouraging more unified approaches to managing market and counterparty credit risk, incentivizing better risk management of counterparty credit exposures, increasing the standards for managing counterparty credit risk by including wrong-way risk, lowering procyclicality, and so on.

In most cases, the ratio of bad loans to total capital and loan reserves causes a financial organization to fail. Profitability is influenced by asset quality via the use of loan reserve provisions. In the event of a deficit, provisions will need to be recorded, cutting into profits via a reduction in interest earned. Interest income is reduced when loans that are past due do not pay interest as planned. As a result, commercial banks need to cut down on their amounts of bad loans and loan reserves (Varaprasad & Rao,

2019; Nguyen et al., 2020). This may be done by removing loan disbursement authority from loan officers who have shown to be incompetent in authorizing loans, tightening controls on credit officers' portfolios at risk (PAR), or any combination of these measures.

Before extending credit, financial institutions should establish sound policies, put them into practice, regularly review loan portfolios, and set aside enough money to cover any losses. Management has failed miserably in the estimation of the results. It might be difficult to put a dollar amount on management quality, but good managers always keep the three E's in mind: economy, efficiency, and effectiveness. As a result, commercial banks would likely reduce their OER, which might boost their profits. Employee and customer happiness, employee and customer turnover, the number of applications, the number of new consumers, and the number of existing customers who close their accounts are all ways in which management may be evaluated (Nguyen et al., 2020). The data from this question might be used to assess the leadership of a financial institution.

When looking at commercial bank profitability using NIM. There is a significant difference between the commercial banks' profit performance and their CAMEL framework. A bank's retained earnings are the primary driver of internal capital expansion. While commercial banks' liquidity levels show a generally positive appraisal, liquidity management practices are especially noteworthy. For the effective daily and emergency liquidity management and risk control, information must be readily available. Appropriately aggregated data is data that is complete yet brief, relevant but not overwhelming, and readily available when needed. If a bank is reporting regularly, it should be able to keep an eye on its liquidity even in a pinch.

Managers should bear in mind the need for crisis monitoring while implementing new management information systems.

4.6.2 The difference in the impact of the CAMEL framework on the profitability of commercial banks in Ghana by ownership.

For a comprehensive analysis of a bank's performance, experts recommend using the CAMEL framework, which takes into account all of these factors: managerial effectiveness; capital strength; earnings capacity; asset quality; and liquidity. Since commercial banks have more liquidity and a better position in the CAMEL components, this study concludes that they are more stable financially than other conventional banks that are not listed (Varaprasad & Rao, 2019; Nguyen et al., 2020; Gazi, 2022). When comparing banks based on their ownership structure, private banks are superior to their public counterparts in terms of capitalization, asset quality, managerial effectiveness, and profitability. This demonstrates that private banks invest a larger share of their income towards developing strategies for minimizing expenses. A commercial bank is the most financially stable in the Ghanaian banking sector, As a result, private banks are shown to be more robust than their public sector counterparts in terms of financial health indicators including asset quality, capital strength, earnings potential, and the efficiency of management. Factors such as bank size, bank age, and ownership type, significantly affect banks' financial performance.

Therefore, financial institutions should not just hand out bigger loans without considering the consequences to lower their credit risk. The government and banks should make it easier for private banks to convert to public banks and allow more public banks into the market as public banks continue to perform well. Banks should also prioritise improving their CAMEL score, which measures five different measures

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of performance. So that public banks may better compete with private banks in the financial market and be driven to improve their financial strength, the government should provide less support for public banks. Banks may now decide which areas of their operations require greater attention by using the methodology given in this study rather than depending just on financial measures, yielding more accurate results and facilitating better strategic decision-making (Anggono, 2017).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Primary goal of this study is to use the CAMEL approach to investigate the factors that influence the profitability of commercial banks in Ghana and to distinguish the impacts by bank ownership. The research questions guiding the study are (i) what is the effect of the CAMEL framework on the profitability of commercial banks in Ghana? and (ii) what is the difference in the influence of the CAMEL framework on the profitability of commercial banks in Ghana by ownership? To answer these questions, static panel regression technique was employed and the results indicated that CAMEL had statistically significant effect on banks' performance. These findings are summarized, relevant conclusions as well as recommendations were made accordingly in the subsequent sections.

5.2 Summary of the Study

The research used the CAMEL technique to analyze variables affecting commercial bank profitability in Ghana and bank ownership. It was detailed and explanatory. This investigation targeted Ghanaian commercial banks. This analysis purposefully sampled 9 GSE banks. Annual reports on the firm's website included secondary data. The data came from companies' annual reports (2010-2021). To estimate research parameters, pooled OLS and random effect models were used.
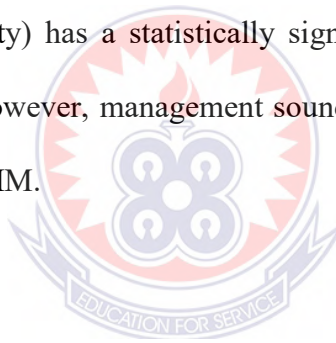
5.2.1 What is the effect of the CAMEL framework on the profitability of commercial banks in Ghana?

Model 1 shows that return on assets positively affects CAMEL by 1%. (Capital adequacy, Asset quality, Management soundness, and Earnings management). ROA hurts liquidity. The research provides three control variables (firm age, firm size, and ownership type) that positively affect ROA. Model 2 shows that ROE positively affects CAMEL (Capital adequacy, Asset quality, Management soundness, and earning management). Model 3 empirical data demonstrate that liquidity, capital sufficiency, asset quality, management soundness, and earning management positively affect NIM. Both commercial banks' capitalization levels and capital bases are strong. Their capitalization is adequate according to international grading criteria. Maintaining or enhancing the CAR would assist banks in weathering any balance sheet shocks. The CAR was able to withstand any shocks to its balance sheets generated by the GFC since it remained sufficiently resilient during the period. Financial institutions are required by Basel II to have an Internal Capital Sufficiency Assessment Process (ICAAP) in place to evaluate the adequacy of their capital in light of the risks they face. Basel III, on the other hand, aims to improve the risk coverage of the capital framework by, among other things, encouraging more unified approaches to managing market and counterparty credit risk, incentivizing better risk management of counterparty credit exposures, increasing the standards for managing counterparty credit risk by including wrong-way risk, reducing procyclicality, etc.

5.2.2 What is the difference in the influence of the CAMEL framework on the profitability of commercial banks in Ghana by ownership?

For local banks, CAMEL (Capital adequacy and Liquidity) has a statistically significant positive influence on return on assets. However, management soundness, earnings management, and asset quality consistency hurt ROA. Additionally CAMEL (earnings management, Capital adequacy, and Liquidity) positively affects ROE. Management soundness and asset quality reduce ROE. Liquidity, capital adequacy, and earning management have a positive influence on NIM. Asset quality and management soundness hurt NIM.

In terms of foreign banks, CAMEL framework (Capital adequacy, earnings management, and liquidity) has a statistically significant and positive influence on ROA, NIM and ROE. However, management soundness and asset quality negatively effects ROA, ROE and NIM.

5.3 Conclusions

5.3.1 What is the effect of the CAMEL framework on the profitability of commercial banks in Ghana?

The research used the CAMEL technique to analyze variables affecting commercial bank profitability in Ghana and bank ownership. It was detailed and explanatory. This investigation targeted Ghanaian commercial banks. Experts recommend using the CAMEL framework to evaluate a bank's performance empirically. This approach evaluates management effectiveness, capital strength, earnings capacity, asset quality, and liquidity. This research reveals commercial banks are financially more stable than non-listed conventional banks since they have higher liquidity and a better CAMEL status. To reduce their credit risk, financial institutions cannot simply grant larger

loans without contemplating the repercussions. The government and banks should make it easier for private banks to convert to public banks and for more public banks to enter the market if public banks continue to perform well. Banks should also prioritise enhancing their CAMEL score, which combines five different performance metrics. For public banks to better compete with private banks in the financial market and to be motivated to increase their financial strength, the government should give less support to public banks. Using the methods outlined in this study, rather than relying just on financial metrics, banks may now determine which parts of their operations deserve more attention, providing more accurate results and allowing for improved strategic decision-making.

5.3.2 What is the difference in the influence of the CAMEL framework on the profitability of commercial banks in Ghana by ownership?

Comparing banks depending on their ownership structure, it can be concluded that foreign banks outperform their local counterparts in terms of capitalization, asset quality, managerial efficiency, and profitability. This demonstrates that foreign banks devote a greater proportion of their income to the development of cost-cutting techniques. As a result, foreign banks are more resilient than their local counterparts in terms of financial health indices, such as asset quality, capital strength, earnings potential, and managerial efficiency. Significant influences on the financial performance of banks include bank size, bank age, and ownership type.

5.4 Implications of the Study

This research shows that capital sufficiency positively affects commercial bank performance. Capital sufficiency increases performance. Banks with enough capital can withstand credit, market, and operational losses. Bank management should ensure

proper capital levels. Also, regulators should evaluate commercial bank capital requirements. A higher ROE/ROA ratio in financial statements might deceive stakeholders. Asset quality and liquidity boost NIM. Non-performing loan ratio and loans-to-deposits ratio are proxies for asset quality and liquidity; increasing these ratios increases NIM owing to a drop in total assets. The results show that management efficiency negatively affects ROE while earning ability positively affects it. By eliminating non-value-added processes and activities, banks can increase their profits by implementing measures to achieve high efficiency. Investors can gain a better understanding of the banks' strengths and weaknesses, allowing them to make more precise and timely investment decisions. In addition, the results suggest to policymakers the major bank performance determinants that should be regulated to ensure a healthy banking system.

5.5 Recommendations

The report concludes that Ghana's banking sector should emphasize efficiency to remain competitive and robust to economic shocks. Financial institutions should ensure personnel understands CAMEL and its ranking. Banks and regulators should have constant interaction. Ghana commercial banks must increase their credit risk management to avoid the poor performance of loans and advances to boost their profitability. Ghana commercial banks, in particular, should branch out into non-traditional areas and earn money from varied businesses other than core banking activities if they are to boost profitability and sustain expansion.

Banks, especially smaller and medium-sized institutions, need to take the initiative to execute a comprehensive strategy to assure capital growth within the period, analyze bad debts, and determine the degree to which bad debt may be converted into equity

to raise their equity. When deciding whether or not to merge with another bank, the interests of the banking system as a whole must be prioritized above those of the individual banks involved. Higher liquidity improves Ghana's commercial banking system, according to regression analysis. As the analysis shows, the improvement in Ghana's commercial banking system is due to the banks' declining liquidity. This strategy aims to improve the efficiency of Ghana's commercial banks by increasing their access to liquid funds.

5.6 Suggestions for Future Research

Future research may use a qualitative method as opposed to the quantitative one utilized in this study. Personal interviews or questionnaires may be conducted with commercial bank managers to inquire about the CAMEL framework and profitability.

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