UNIVERSITY OF CAPE COAST

CAPITAL ADEQUACY AND PERFORMANCE OF BANKS LICENSED IN GHANA

BISMARK OSEI TUTU

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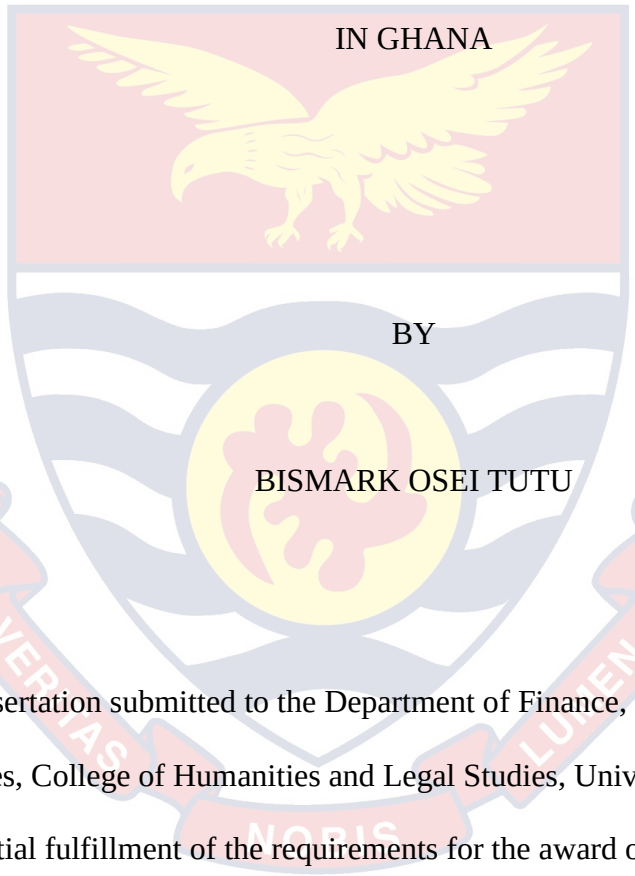

BY

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Dissertation submitted to the Department of Finance, School of Business Studies, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Business Administration Degree in Finance.

OCTOBER 2020

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's signature…… Date……

Name: Bismark Osei Tutu

Supervisors' Declaration

I hereby declare that the preparation and presentation of the dissertation was supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast

Supervisor's Signature: …… Date: ……

Name: Dr. Otuo Serebour Agyemang

ABSTRACT

Concerns on capital adequacy has received much attention especially because of the recent financial predicaments in the economy and the role it played in the closure of some commercial banks in Ghana in 2017 and 2018. Empirical studies have shown that substantial capital adequacy is one of the sure ways of circumventing credit risks which plunges the profits and sustainability of the banks. The motivation for the study is that prior to 2019, most of the studies on banking risk focused on rural, small and just few bigger banks. Also, most empirical studies assessing the relationship between capital adequacy and bank profitability in Ghana have focused on return on assets and return on equity as measures of performance. Thus the study sought to examine the effect capital adequacy has on bank performance, by employing net profit after tax and return on capital employed as measures of performance. The study employed the explanatory research design, quantitative research approach. The study employed the General Least Squares random effects panel estimating approach to estimate the effect of capital adequacy ratio on bank performance. First, the results reveal that the capital adequacy ratio generally increase bank performance in terms of net profit after tax. Again, the results revealed that capital adequacy ratio generally decreases bank performance in terms of return on capital employed. Thus, the study recommended that to enhance performance, banks should strive to keep their capital adequacy ratio at the required levels to make them competitive.

KEY WORDS

Capital Adequacy

Net Profit after Tax

Performance

Return on Capital Employed

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DEDICATION

To My Wife and Children

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LIST OF ACRONYMS

CAR	Capital Adequacy Ratio
NPAT	Net profit after Tax
ROA	Return on Assets
ROCE	Return on Capital Employed
ROE	Return on Equity

CHAPTER ONE

INTRODUCTION

Introduction

In a bid to promote efficiency in the banking industry, the Basel framework introduced and endorsed a new capital adequacy framework in 2004 to help in the regulation of banks and other financial institutions. Capital adequacy concerns in banking have been issues that may date back to probably the inception of banking because of risks involved in their line of operations or activities. In Ghana, capital adequacy in the banking industry has been a lot of talking points. There has been a number of capital adequacy reforms in the banking sector in Ghana, but what is its impact on the profitability of licensed Ghanaian banks. This paper therefore sought to examine the effect of capital adequacy on profitability of licensed banks in Ghana.

Background of the Study

Capital adequacy concerns in banking have been issues that may date back to probably the inception of banking because of risks involved in their line of operations or activities (Vento & Ganga, 2009). The arguments in favour of capital adequacy stems from the dual roles played by banks in an economy by way of acting as intermediaries in deposit taking, provision of credit (lending to clients), currency exchange and money transfers and also being able to generate streams of income (Tariq, Usman & Mir, 2014). However, the quest to create credit and make profit by banks leaves them in the wake of the much talked about “banking risks”. According to Gizaw, Kebede and Selvara (2015), the only thing to fill the gap or circumvent the risk are prudent management

decisions (good corporate governance) and enough liquidity buffer (e.g. capital adequacy ratio, lower loan losses, return on assets, etc,).

According to Tariq et al. (2014) among the risks faced by commercial banks, credit risk is the most important one because of its ability to thwart the profitability and by extension affect the sustainability of the bank. The study even went ahead to state that the collapse and other financial difficulties encountered by banks and other financial institutions are as a result of inept credit risk management practices. It may not be out of place to state that credit risk management is significant to the performance and profitability of every financial institution and bank for that matter. Korteweg and Polson (2008) also said it very correctly that risks in the financial institutions are inevitable thus in order to have an assured level of continuity, banks must pay attention to the optimum level of risks they manage.

Capital adequacy ratio has been defined as the ratio of adjusted equity base to risk adjusted asset base as required by the Bank of Ghana (BoG) (Pricewaterhouse Cooper, 2014). In Ghana, capital adequacy in the banking industry has been a lot of talking points. This comes on the heels of the fact that in recent times more than over five commercial banks have been collapsed due to low capital adequacy levels.

Since the inception of the banking institution in Ghana, capital adequacy ratios have been reviewed four times by the central bank of Ghana. First was at the beginning of the structural adjustment program (SAP) and the economic recovery programs (ERP) and it was pegged at 5%, then 10% in 2011 (Afriyie & Akotey, 2013) in the heat of the financial crises and the commercial exploration of oil and now 15% in 2018. These reviews were all done in order

for commercial banks to stay effective and efficient in the discharge of their activities. This revelation gives the indication that capital adequacy ratio is something that should not be taken slightly if the bank is to stay operational and make profits.

Profitability in the banking industry on the other hand has been defined to reflect improvement or increase in the profits or assets of the bank. It measures the earning power of a business entity. It is an important element of the bank's value creation and a critical step toward shareholders' wealth maximization. Profitability shows how efficiently the management of banks can make profit by using all the resources available in the market. According to Harward and Upton (1991) bank profitability is the ability of a given bank to earn a return from the use of its assets. By the close of 2009, the profitability ratios of the banks as measured by the return on assets (ROA), return on earning assets (ROEA) and return on equity (ROE) had seen some continuous decline since 2007 (Nkegbe & Ustarz, 2015).

According to Olalekan and Adeyinka (2013), banks profitability depends on the bank's policy decisions as well as uncontrollable factors relating to the economy and government regulations. The knowledge that capital adequacy influences the financial sector's profitability is essential not only for the managers of banks, but for other stakeholders such as the central banks, bankers' associations, governments, and other financial authorities. Concerns on capital adequacy especially has received much attention because of the recent financial crises in global economy and the role it played in the closure of some commercial banks in Ghana in 2017 and 2018. These financial crises left a lot of investors and depositors in a financial difficulty leading to moral hazards.

Empirical studies have shown that substantial capital adequacy is one of the sure ways of circumventing credit risks which plunges the profits and sustainability of the banks (Almumani, 2013; Gizaw et al., 2015).

The measurement of profitability in most studies revolves around three variables—return on assets (ROA), return on equity (ROE) and net interest margin (NIM) (Ross, Westerfield, Jaffe & Jordan, 2011). Whichever one a study uses must reflect an increase in the income or assets of the bank. The pass-through effect is that enough capital adequacy is able to ensure that banks are able to venture into other investment that invariably accrues interest for the bank. Again, enough capital adequacy helps banks to absorb risks and thereby make more money. Due to capital inadequacy of many banks in the country, they were faced with high cost of financial distress and this certainly affected profitability (BoG, 2018).

According to Moussu (2013) banks are one of the institutions that enhance economic development through the financial services they provide to the public and business community and this economic development is achieved through the role they play. To this end their performance and continuity is very crucial. Any thing that makes the capital adequacy of a bank to reduce may be seen as risky and the bank ought to be weary of. The Bank of Ghana (2018) stressed that the spate of bad loans has been high as 25% in Ghanaian Commercial Banks between 1999 and 2010 and the rates increased to 41% 2016.

The increasing level of non-performing loan rates in banks' books, poor loan processing, undue interference in the loan granting process, inadequate or absences of loan collaterals among other things, are linked with poor and

ineffective credit risk management that negatively impact on banks profitability (Sami & Zouari, 2011). Thus, in order to protect the interest and the wealth of bank shareholders and depositors, banks need to investigate and monitor the activities of the will be and existing borrowers and also accumulate enough risk buffer or capital adequacy. Adequately managing of those risks related with credit is critical for the survival and growth of any financial institutions (Ahmad & Ariff, 2007).

Various studies suggest that banks with higher levels of capital perform better than their undercapitalized peers. Staikouras and Wood (2003) claimed that there exists a positive link between a greater equity and profitability among EU banks. Abreu and Mendes (2017) also trace a positive impact of equity level on profitability. Goddard et al. (2016) supports the prior finding of positive relationship between capital/asset ratio and bank's earnings.

Statement of Problem

Despite the financial sector reforms in Ghana since the 1990s with an aim of improving profitability, efficiency and productivity, commercial banks' performance has remained poor with substantial gaps in service delivery to private agents (Munyambonera, 2013). Changes in profitability are an important contributor to economic progress via the influence profits have on the investment and savings decisions of companies. This is because a rise in profits improves the cash flow position of companies and offers greater flexibility in the source of finance for corporate investment.

Empirical studies have shown that substantial capital adequacy is one of the sure ways of circumventing credit risks which plunges the profits and sustainability of the banks (Almumani, 2013; Gizaw et al., 2015). Thus this

study argues that, evaluating profitability in terms of capital holds the key to the modern approaches towards evaluation of performance. Capital is the corner stone of bank's strength, and acts as a defense against uncertainty and unanticipated losses.

Results on Profitability in the banking sector in Ghana have been mixed. There are a number of studies in Ghana on banks performance and profitability in Ghana. However, most of these studies focused on only a limited number of banks (Almumani, 2013; Dermerguc-Kunt & Huzingha, 2011; Gizaw et al., 2015). Also, most empirical studies assessing the relationship between capital adequacy and bank performance in Ghana have focused on return on assets and return on equity as measures of performance. However, according to Nachiket and Maheshiwari (2018), the increment or the return on capital, which is a scarce resource in terms of banking firms, should rather be the basis of evaluating bank performance.

This study therefore assesses the impact of capital adequacy on the profitability of banks licensed in Ghana using net profit after tax and return on capital employed as measures of performance.

Purpose of the study

The purpose of this study is to examine how capital adequacy influences the level of performance of licensed commercial banks in Ghana.

Objectives of the study

1. To determine the effects of capital adequacy on the net profit after Tax
2. To examine the effect of capital adequacy on return on capital employed.

Hypotheses

1. H_1: Capital adequacy has significant positive effect on net profit after Tax of banks licensed in Ghana.
2. H_1: Capital adequacy has significant positive effect on return on capital employed of banks licensed in Ghana.

Significance of the study

The study would be of benefit to bankers, financial sector regulators, financial analysts, auditors and other key stakeholders in the banking industry because it would help establish the relationship between bank profitability and capital adequacy. Regulatory bodies such as the bank of Ghana may benefit immensely from this study and may influence regulatory policies from the central bank, since the component of credit risk management, capital adequacy and profitability would be established at the end of the study. Bankers and management of banks would also be able to make informed decisions regarding their capital adequacy management and profitability. In addition, financial analyst and auditors can better analyze financial statement of banks and forecast a trend or determine expected behavior of capital adequacy in relation to profitability of banks. This study is hoped that, it helps banks to realise that raising capital adequacy may not only absorb risk but also increase the profits margins of the bank. The study will add to the stock of literature on credit risk management and profitability of licensed banks.

Delimitations of the Study

Generally, this study seeks to examine how improvement in capital adequacy influences the profitability of some commercial banks in Ghana. The study employs annual data in Ghana from 2010 to 2018. Data for the study was

retrieved from the annual financial statements of the banks. The data were on 21 licensed commercial banks in Ghana. This implies that banks that came into existence in 2018 and beyond are excluded from the study since it was impossible to obtain financial statement for the period under study.

Limitations of the Study

Even though the sample included all 21 banks actively operating in Ghana, the secondary data analysis for the banks was limited. Moreover, since the dataset are already prepared in some way that suits the owner, it is possible to restrict the analysis to a certain angle. Published financial statements for some banks were not available for all the years and this restricted the number of years used for the study. Again, employing only banks in the analysis limits the scope of the study since the findings cannot be generalized to cover all deposit taking financial institutions. The use of a single country data further diminishes the generalizability and extinguishes the opportunity of making comparison with other parts of the world.

Definition of Key Terms

Capital Adequacy

Capital adequacy which is determined by capital –asset ratio is a requisite for banks' effective operation which is a function of the deposits and capital funds. It is thus concerned with the sufficiency of banks' capital for the safety of their deposits.

Net Profit after Tax

Net profit after tax is a financial measure that shows how well a company performed through its core operations, net of taxes. Profit after tax (PAT) can be termed as the net profit available for the shareholders after paying

all the expenses and taxes by the business unit. The business unit can be any type such as private limited, public limited, government-owned, privately-owned company, etc.

Return on Capital Employed

Return on capital employed (ROCE) is a financial ratio that measures a company's profitability and the efficiency with which its capital is used. In other words, the ratio measures how well a company is generating profits from its capital. The ROCE ratio is considered an important profitability ratio and is used often by investors when screening for suitable investment candidates.

Organization of the Study

Chapter one deals with the introduction and background to the study. The section contains the statement of the problem, purpose of the study, the research questions and hypothesis. The researcher states its significance, the delimitation, limitation and ended the chapter with the organization of the study. Chapter Two deals with review of related literature where the researcher have discussed the views of other researchers that are related to the knowledge and utilization of alternative banking and adjusting it to meet financial performance of commercial banks. Chapter Three contains the introduction to the chapter, and the research methodology and design. The study design outlines the sources of data, data management procedures and tools for data analysis. The Fourth chapter deals with data analysis. It deals with a careful examination of the data collected. Here, the researcher assessed, described and explained the data in relation to the study objectives. The study ended with chapter five. In this chapter, the researcher summarized the major findings; provides recommendations and drew conclusions from the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter presents the review of relevant literature on the effects of capital adequacy on the performance of commercial banks in Ghana. This chapter is generally sectioned into; theoretical literature and empirical literature review. The theoretical literature focused on the theories identified with capital adequacy and bank's profitability. In addition, the empirical literature shed light on the relationship between capital adequacy and profitability.

Theoretical review

Under this section, some related theories are reviewed. Attributable to the impact of capital adequacy on the performance of the banking industry, it has gotten a great deal of consideration from scholars and writers from the abstract world. Different theoretical points of view on capital adequacy have been expressed on the relationship between capital adequacy and profitability of firms in the banking industry.

Buffer Theory of Capital Adequacy

The Buffer Theory of Capital Adequacy was propounded by Calem and Rob (1996). According to this theory, banks may prefer to hold a 'buffer" of excess capital to reduce the probability of falling under the legal capital requirements, especially if their capital adequacy ratio is very volatile (Aruwa & Naburgi, 2014). the Buffer Theory is considered most suitable for this study as it in consonance with Bank of Ghana's approach in ensuring Capital Adequacy for its bank's operational efficiency.

The theory suggests that a bank approaching the regulatory minimum capital ratio may have an incentive to boost capital and reduce risk in order to avoid the regulatory costs triggered by a breach of the capital requirements. The theory also predicts that poorly capitalized banks may also be tempted to take more risk in the hope that higher expected returns will help them to increase their capital. This is one of the ways risks relating to lower capital adequacy affects banking operations. This implies that the management of capital adequacy issues are germane for the profitability of banks.

Efficiency Structure Theory

The basic precept of the efficiency structure theory is that a bank's profitability is inclined by internal efficiencies of the bank or the financial institution (Olweny & Shipho, 2011). The theory further accepts that banks acquire high benefits since they are more productive than others. Hence, for banks to remain in business or survive, they have to be efficient. The efficiency here means that the bank must take the right decisions, make profits on the investments and reduce cost or risks (Kamau, 2013). Indeed, since capital adequacy is the statutory minimum reserves which a bank must have, keeping it is one of the ways banks can keep up efficiency and enhance profitability (Kamau, 2013).

Linking the efficiency structure theory to this study, this study argues that as banks manage their credit risks well, the prevent severe impairment of their capital base. Profitability is an index of efficiency; and is regarded as a measure of efficiency and management guide to greater efficiency. This means that managing the capital adequacy of banks can improve heir profitability and efficiency.

Capital Adequacy Ratio in Ghana

Capital adequacy is well-defined as the total funds that a financial institution must hold to be able to carry out its daily activities (Kishore 2005; Pandey 2005). Yu (1996) defines adequate capital as the amount a deposit-taking institution needs to hold to ensure that depositor funds are insured. Holding adequate capital fills in as a safeguard for potential or possible losses and prevents financial institutions from winding up. Capital adequacy alludes to the idea of re-organising banks' existing capital structures so as to rebuild the banking system against widespread of distress. If adequate capital is well managed by banking sector, it can serve as an open door for better standards in banking industry and later lead to better performance (Olalekan & Adeyinka ,2013).

Capital adequacy of a bank is very significant in the light of the global financial crisis where rescue measures are currently being employed by the regulatory authorities to keep the financial system afloat. Globally, Basel committee indicates minimum capital adequacy ratio to be eight percent (80%) of banks 'credit taken as the benchmark for estimating the capital adequacy of a bank. It is therefore an evident truth that the role of financial institutions in extending credits to borrowers makes their business risky. There is always a risk of borrowers defaulting however the negative impact of insolvency posed by this risk is forestalled through the holding of adequate capital by financial institutions. It could therefore be assumed that the frequent calls for re-capitalisation of banks by regulatory bodies is aimed at ensuring that depositor funds are secured and that banks stay solvent and profitable.

Capital Adequacy Ratio (CAR) as expressed by the Basel Committee measures capital adequacy. CAR is expressed as a percentage of the bank's total capital to its total risk-weighted assets. In Ghana, the central bank (Bank of Ghana) has recently increased the capital of banks from GHS120 million to GHS400 million. This is to guarantee that the capital of banks is sufficient to cover the risks they take in their operations and keep them solvent regardless. As indicated by the PWC (2019) banking survey of Ghana, the Capital Requirement Directive (CRD) establishes higher Risk-Weighted Assets (RWA), tougher capital standards through progressively prohibitive capital definitions, extra capital cushions and higher prerequisites for minimum capital ratios. Furthermore, it creates liquidity standards that could necessitate new balance sheet strategies aimed at limiting illiquid assets, restricting wholesale/unstable sources of funding and managing higher funding costs. The new directive will have a wide effect across numerous banks, especially on those focused on commercial, wholesale and retail banking activities.

The new reforms likewise expect banks to embrace significant process and system changes to accomplish upgrades in the areas of stress testing, counterparty risk and capital management infrastructure. Simultaneously, banks are also required to invest in functionality systems to track, monitor and report on a variety of transactions, ensuring compliance with international legislation, such as Internal Capital Adequacy Assessment Process.

The PWC (2019) banking survey in Ghana revealed that 92% of banks interviewed have met and, in some cases, exceeded the 13% CAR required under the new Capital Requirement Directive framework. This is an indication of the resilience and robustness among incumbent banks in the industry as they

are now cushioned against any unexpected losses that may arise from their business through capital transactions, credit, operational and market risks. Albeit few banks (8%) that have not met the minimum CAR, they intend to do so through raising capital from prospective investors and review/reclassification of their loan book. This is a direct result of the performance benefits related with the capital adequacy ratio.

Empirical Literature

Studies on the relationship between capital adequacy and profitability have stress that capital adequacy ratio may be a decent approach against risk, yet added that it must not be used alone (Ross et al., 2011). This is because it is not only capital adequacy ratio that influence profitability but other factors such as non-performing loans, provision for loan loss or write off ratios, portfolio at-risk, operating efficiency and some bank characteristics.

Ranga (2012) carried out studies on the effect of minimum capital requirements on deposit money banks performance in Zimbabwe. A sample of twenty-seven senior bank officials were used as the population of the study and the information gathered were analysed using descriptive, correlation method and regression analysis. The findings uncovered a significant and positive relationship between money deposit banks capitalization and its performance.

Similarly, Onaolapo and Olufemi (2012) investigated the impact of capital adequacy on the profitability of the Nigerian banking sector using OLS estimation technique. Secondary data were gathered on the measure of capital adequacy ratio and bank performance variables for a ten- year time frame, 1999-2008 and an Augmented Dickey Fuller to test for stationary and a pair wise granger causality test were adopted for the study. Findings revealed that the

bank performance variables tested, return on Capital Employed (ROCE), Return on Assets (ROA) and Efficiency Ratio (ER) does not have significant relationship with capital adequacy of the banking sector.

Olalekan and Adeyinka (2013) examined the effect of capital adequacy on Nigerian banks' performance. The study explicitly, analysed the effect of capital adequacy on profitability of deposit taking banks in Nigeria with the focus on effect of capital adequacy of both foreign and domestic banks in the country and their profitability. The study makes used of primary data through administered questionnaires. The study revealed that there is a significant positive relationship between capital adequacy and bank's profitability.

Additionally, Ezike and Oke (2013) examined the effect of the adoption of the capital adequacy standards on the performance of Nigerian banks. The study measured capital adequacy standard with loans and advances, shareholders fund, total assets and customer deposits. Hence, the performance of banks was measured by Earnings per share and profit after tax. The study employed the OLS estimation techniques, the study revealed that capital adequacy standards exert significant impact on bank performance.

Ejoh and Iwara (2014) assessed the impact of capital adequacy on money deposit banks' profitability in Nigeria, traversing through 1981-2011 with five selected banks. The study utilized the Engle and Granger two steps procedure in co-integration and the t-statistics to determine significance. The study revealed that capital adequacy plays an important role in explaining bank returns on assets a measure of bank profitability. Also, Ayayalin and Karakaya (2014) probed the effect of banks' capital on profitability and risk level for Turkish banking sector between 2003 and 2011. The two step system

generalized method of moment technique for dynamic panel was applied and the study revealed that, there was a positive relationship between capital and profitability.

Torbira and Zaagha (2016) reconnoitered the impact of capital adequacy indicators, the ratio of shareholders' fund to banks' total deposits and the ratio of shareholder funds to bank total assets on bank financial performance measured by net profit margin, earnings per share and return on assets in Nigeria. The analysis was done using Augmented Dickey Fuller unit root test and the Granger causality test revealed the presence of significant long run relationship between bank financial performance variables and capital adequacy indicators in the Nigerian banking industry. It was additionally revealed that capital adequacy unequivocally and effectively stimulated and improved the financial performance of banks in Nigeria.

Ini and Eze (2018) examined the impact of capital adequacy prerequisites on the performance of deposit money banks in Nigeria. The study used secondary time series data, which was sourced from the NDIC and CBN Annual and Bank Supervision Reports. The study employed Ordinary Least Squares (OLS) regression analytical techniques. The study revealed that capital adequacy had positively affected the financial performance of deposit money banks in Nigeria. This implies that capital adequacy strongly and actively stimulates, improves and develops the financial performance of deposit money banks and that sufficiency of capital and adequate management can translate to improved performance.

An examination by Okoro (2019) studied the effect of capital adequacy on financial performance of deposit money banks in Nigeria, by using Panel

approach between 2008 and 2017 with focus on Return on Asset (ROA) as a proxy for dependent variable (Banks financial performance). Liquidity ratio, capital ratio, investment ratio, Loan and Advance serve as proxies for independent variable (Capital adequacy of money deposit banks). The study found a positive effect of capital adequacy on bank performance.

Demirguc-Kunt and Huizingz (1999) conducted an in-depth study which examined the determinants of banking performance for 80 countries, both developed and developing, during the period 1988-1995. They concluded that foreign banks have higher profitability than domestic banks in developing countries while the contrary holds in developed countries. Nonetheless, their overall outcomes indicated support for positive relationship between the capital adequacy ratio and financial performance.

Flamini, Calvin and Liliana (2009) employed a sample of 389 banks in 41 SSA countries to study the determinants of bank profitability. They discovered that apart from credit risk, higher return on assets is associated with larger bank size, activity diversification, and capital adequacy ratio. Sanusi (2010) examined the right level of capital adequacy which could enhance the profitability of banks and found that bank needs to ensure an appreciable level of capital adequacy so as to improve its profitability.

Other studies on capital adequacy and bank financial performance rather found a negative association between capital adequacy and financial performance in general while some others found no significant relationship.

For instance, Musyoka (2017) in his study on the impact of capital adequacy on the financial performance of commercial banks in Kenya studied 42 commercial banks using a census survey. Secondary data of the financial

statements of these banks were also used. To set up an existing association between the dependent and independent variables, descriptive statistics such as frequency distributions, pie charts, measures of central tendency and line graphs that described the data were used. Causal relationships between the variables were established through a linear equation. Findings of the study indicated that capital adequacy have a negative effect on the financial performance of commercial banks.

Aruwa (2014) conducted a study on the impact of capital adequacy on the financial performance of quoted deposit money banks in Nigeria. The study looked at financial performance concerning profit and saving mobilisation of quoted banks in Nigeria. Data spanning through 1997-2011 was used as well as the descriptive research design of time series. To determine and analyse the association between capital adequacy and financial performance, the ordinary least square method of regression was employed. Capital adequacy was proxy to capital to risk -weighted assets while profitability was measured as profit after tax to total assets and saving mobilisation as customers' deposits to total liabilities. The findings showed that CAR has an insignificant impact on bank profitability and the bank's savings mobilisation. The study in this way concurs with the buffer theory of capital adequacy, which clarifies why losses are incurred by some banks, which have an huge capital base. This is because findings of these studies showed a significant negative impact of capital adequacy ratio on financial performance.

Awdeh (2016) performed a study on the development of credit. He surveyed thirty-four banks with sixteen years data spanning 2000 to 2015. The study indicated that factors such as GDP growth, money supply, deposit growth

and inflation enhanced the ability of banks to give out credit facilities to the private sector. Factors such as T-bill rate, interest rate, credit risk, and public borrowing and remittance inflows were seen to have a negative effect on the growth of loans.

Ejoh and Iwara (2014) in their research on the influence of capital adequacy on deposit money bank's (commercial and merchant banks) profitability in Nigeria established that capital adequacy is vital in the explanation of a bank's return on assets (ROA) that is a proportion of the bank's profitability. ROA was chosen as the measure of profitability due to its ability to measure the profitability and efficiency of a bank in creating income from the bank's total assets. The study used the Engle and Granger two steps procedure in cointegration and t-statistics for its analysis. Examining the yearly reports and financials of five banks for a time allotment of 20 years, the examination established a positive significant relationship between capital adequacy and the bank's profitability. These outcomes propose that bank's with greater equity capital are viewed as safe and can have less expensive sources of funds thereby making them more profitable. This is on the grounds that being solvent helps banks to attract in new customers and shareholders as well as maintain their existing customers. Such banks are likewise ready to meet the credit requests of their clientele. The aftermath from this study was that a periodic review of such banks in Nigeria be done to guarantee they were well capitalised and thereby more profitable.

Amidu (2014) in his study of the factors of bank lending in Sub-Saharan Africa (SSA) found linkages between the health of bank balance sheets and lending. He studied 24 countries in the region using bank and country-level data.

The study used panel regression to analyse data collected from 264 banks in these countries more than eight-year time frame. The study revealed that giving out loans to the private segment in SSA is determined by the size of the bank, its growth level and management efficiency. In addition, it revealed that the decision of banks to give out loans is influenced by the conditions for entry, regulatory power and capital requirements. A negative association is established between monetary policy and bank lending in SSA. Thus, bank lending is reduced when policy-induced interest rates are increased.

Okoye, Ikechukwu, Christian, Chinyere and Christian (2017) also investigated the effects of capital adequacy on the performance of banks in Nigeria. Relying on panel data from 2010 to 2015 and using statistical analysis such as Pearson correlation coefficient and multiple regressions, they found that capital adequacy and financial performance of banks have a negative relationship.

Li and Zou (2014) explored the association between credit risk management and profitability of commercial banks in Europe. They showed that non-performing loan ratio and capital adequacy ratio were used as independent variables and proxy for credit risk and return on assets and return on equity were very important to profitability of banks. The results showed that there was a negative relationship between non-performing loans, capital adequacy and profitability (ROE).

Again, Gizaw, Kebede, and Selvaraj (2015) investigated the effects of credit risk management on profitability of commercial banks in Ethiopia. Eight (8) commercial banks were sampled and secondary data was gathered from their annual reports for a 12-year period. It was revealed that variables such as loan

loss provisions, non-performing loans and adequacy of capital have substantial effects on the performance of commercial banks in Ethiopia.

In the panel study of Onaolapo and Olufemi (2012) on commercial banks in Nigeria using ROE as a measure of profitability and secondary data collected from publications of the Central Bank of Nigeria for a ten-year time frame with the Ordinary Least Square (OLS) technique, it was seen that capital adequacy has no significant relationship on bank profitability.

As per Boahene, Dasah and Agyeir (2012) there was significant and negative relationship between capital adequacy and commercial bank's performances in Ghana. Kithinji (2010) in an attempt to analyse the impact of credit risk management on the profitability of commercial banks in Kenya for the period 2004-2008 indicated that majority of commercial banks are not affected by the amount of credit risks especially in period of economic growth.

Again, Mohammad (2015) expressed that bank capital adequacy ratio (CAR) is an important bank specific variable in the profitability of that bank. Moreover, the study using a pooled OLS method on Pakistani banks maintained that lowly developed country banks are more solvent than banks of a developed country. The contention comes from the instinct that banks in less developed countries adhere to the requirement of the Basal III Accord (sufficient minimum capital reserve that is 8% of the total assets) compared to banks in the developed countries.

Dreca (2013) using OLS regression assessed the determinants of profitability in Bosnian banks and found that capital adequacy significantly influences the level of profitably. Similarly, Allen, Nilapornkul, and Powell

(2013) using mixed method found capital adequacy had negative effects on profitability in Thai banks.

Moreover, in the study of Ikpefan (2013), it was revealed that there was a significant negative relationship between CAR and asset quality in the Nigerian Deposit Money Banks. The reason is that most Nigerian citizens have perfect information on banks and as such do business with viable and credible banks. The study moreover admonished that for profitability to improve significantly, they ought to lessen their non-performing loans.

In other studies, Abba Okwa, Soje and Aikpitanyi (2018) revealed that banks with more loan loss reserves are more aggressive or forceful in their lending practices and are willing to accept losses instead of negotiating concession with loan defaulters. Whereas the presence of enough capital bases would have helped them to sieve through clients and get the quality ones, but for limited capital, any customer would be admitted. In addition, Moh'd Al-Tamimi and Obeidat (2013) stated that a high loan loss reserves may signal banks that are willing to write-off problem loans which are expected to reduce bank credit risk. Thus, there exists a negative and significant relationship between CAR and profitability of banks.

Ikpefan (2015) analysed the effect of bank capital adequacy ratios, management and performance in the Nigerian commercial banks. The study used both cross sectional and time series of bank data. The examination employed OLS regression analytical techniques. The study revealed that the ratio of the Shareholders Fund to Total Assets which measured the capital adequacy had a negative impact on Return on Assets and efficiency of

management measured by operational costs indices was contrarily related to return on capital.

Ugwuanyi and Enah (2015) examined effect of bank capital requirement on bank performance. A simple ratio analysis and least square statistical technique were used by contrasting the performance of bank for five years before and five years after the 2005 recapitalization exercise. The outcome demonstrated that greater part of the bank performance assessment indicators for the pre-capitalization were better than the post capitalization means and the t-test indicated that the contrast between the two means at 5% level of significance was not statistically significance. This suggests that recapitalization without a conducive or favorable and sound macro-economic environment does not always transform to enhanced bank performance.

Particularly for Ghana, a few studies have been carried out in this area. For instance, Madugu, Ibrahim and Amoah (2020) investigated the effect of credit risk and capital adequacy ratio (CAR) on profitability of the overall banking sector. Their study aimed at determining their differential effects on profitability of local and foreign banks within Ghana's banking sector using 11 banks from 2006 to 2016. Results from the study show a positive and significant effect of credit risk on profitability with huge effect for local relative to foreign banks. However, CAR negatively affects profitability of foreign banks with no apparent impact on local banks.

More so, Annor and Obeng (2017) employed the Random Effect Model on six selected listed commercial banks in Ghana to assess how credit risk management impacts on the profitability. They observed that while capital adequacy ratio had positive relationship with a bank's profitability; non-

performing loans, loan loss provisions ratio and loan to asset ratio had statistically significant negative relationship with the profitability of a bank.

Employing data from the financial statements of 10 banks from each country for 7 years period, Boateng (2018) examined the determinants of profitability of banks in India and Ghana. The findings indicated that credit risk, net interest margin, capital adequacy and inflation were the most important factors that significantly affect profitability of banks in both Ghana and India. He therefore recommends that strict compliance of capital adequacy requirement must be enforced by the regulatory bodies in both countries.

Alnaa, Adongo, and Juabin (2016) conducted a comparative analysis of the profitability of foreign and local banks in Ghana utilizing a sample of six banks of which three are foreign banks. They found that foreign banks have outperformed the local banks in terms ROA, Capital adequacy and ROE. The local banks however, performed better than the foreign banks in management efficiency, except in 2009. They therefore concluded that, the foreign banks are more profitable than their local counterparts during the period under study.

Nagaraju and Boateng (2018) also found capital adequacy, non-performing loans, bank size, inflation and GDP growth rate all negatively influenced profitability of savings and loans companies in Ghana while Loans and Advances had positive impact on profitability.

Gaps in existing studies

The empirical studies revealed so far delineates mixed findings with regards to the relationship between capital adequacy ratio and bank profitability. These propose that the measures of profitability (that is, ROA and ROE) that have been utilised in extant literature may not be an acceptable measure of

profitability (Nachiket & Maheshiwari, 2018). Hence, corollary to this argument, Net profit and return on Capital employed represents a better measure of profitability, contrary to existing literature on the relationship between capital adequacy and profitability, this study employs Net profit and return on Capital employed to look at the relationship between Capital adequacy and profitability of banks licensed in Ghana.

Chapter Summary

The chapter started by introducing theories that support the relationship between Capital Adequacy ratio and profitability. Moreover, this section clarified the present province of Capital adequacy requirement for Banks and Ghana. Lastly, this chapter offered an empirical review on the relationship between capital adequacy and profitability. The empirical review uncovered that even the inadequate literature on the relationship between capital adequacy ratio and profitability portrays mixed findings. Subsequently trying to clarify the mixed findings, this study contends that Net profit after Tax just as return on capital employed represents better measures of profitability of banks.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter presents the methods employed for the analysis of the study. It begins with the research design and the research approach of the study. Then the theoretical model specification, the empirical model specification, data source and description followed. The theoretical empirical models give the framework for analysing the study. The next section was the justification of variables and then the data analysis and the estimation techniques. Finally, the data sources and measurement of variables were presented.

Research Design

Research design can be exploratory, descriptive or explanatory (Saunders et al., 2012). The study employed the explanatory research design. Explanatory research design investigates the cause and effect of one or a set of variables (independent) on another variable (dependent) in a theoretical model that is developed (Saunders et al., 2012). Explanatory research design places importance on studying a situation to explain the relationships between variables. The study is grounded on explanatory research design since it sought to examine the cause and effect of Capital adequacy and profitability of banks licensed on the Ghana stock exchange.

The quantitative approach is appropriate for this study because of the objective of the study to explain how capital adequacy influences the profitability of some commercial banks in Ghana. In other words, it looks at the causal relationship between capital adequacy and profitability. The quantitative approach enables the researcher to put the social world into a structure of

causality and nullifies the role of human effect through the use of a quantitative instrument such as multivariate statistical analysis in analyzing data as used in this study. More specifically, since the objective of the study is explanatory in nature the study adopted the explanatory research under the quantitative approach. That is, numbers were employed to examine the relationship between Capital adequacy and profitability of banks licensed on the Ghana.

Data screening Procedures

The total number of banks in Ghana before the recent recapitalisation in 2018 was thirty-one (31) and thus represented the population from which the sampled banks for this study were drawn. To avoid bias from selecting only the banks that met the GHS400 million, the study employed all banks provided they had available information on profit after tax, return on capital employed and Capital Adequacy Ratio (CAR). Eventually sample of twenty-one (21) out of thirty-one (31) licensed commercial banks operating in Ghana was used for this study.

Empirical model selection

Following the models of Chipeta and Kanyumbu (2018); Bhullar and Gupta (2017); and Elsas et al (2010) the model for the study is modelled as follows;

$$Y_{it} = a_0 + \sum_{j=1}^{n} X_j Z_{it} + \in_{it} \quad (1)$$

Where; Y_{it} is profitability of bank i at time t, X is regression coefficient of bank i, Z_{it} is bank specific independent variables of bank i at time t and ϵ_i is the error term. Equation 1 is expanded as follows;

$$PER_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 DEPRAT_{it} + \beta_3 LIQ_{it} + \beta_4 SIZE_{it} + \varepsilon_{it}$$

Here, the PERF is the bank performance variables, CAR is capital adequacy ratio, DEPRAT is deposit ratio, LIQ is liquidity and SIZE is bank size.

Justification of the Model

Capital adequacy ratio (CAR)

Capital adequacy ratio measures capital strength and determines whether the banks have sufficient capital against existing and potential losses from credit risk. CAR was selected for the study because it's one of the major indicators of credit risk used in the measurement of bank's financial strength from the view point of regulator (Abiola & Olausi, 2014). According to Afriyie and Akotey (2013), banks with good capital adequacy ratio have good profitability and again a strong capital adequacy is able to absorb possible loan losses and thus avoids bank 'run', insolvency and failure.

In addition, well-capitalised banks face a lower cost of going bankrupt which reduces their cost of funding (Kosmidou, 2008). Therefore, banks with high levels of capital adequacy ratio indicates that the bank is highly profitable and therefore will be able to absorb bad loans.

Level of Deposits

According to Okun (2012) explained that the level of deposits have a positive and significant relationship between deposits ratio and several measures of profitability. Thus the study expects a positive effect of level of deposits on bank performance.

Liquidity

Liquidity is a serious factor that has an impact on the profitability of banks. Liquidity is the ability of a business to pay off its short-term debt obligations. Kijjambu (2015), states that liquidity may arise from the possible

inability of a bank to accommodate decrease in liabilities, thus affecting bank profitability, since it becomes hard to raise funds for increasing demand for loans. Thus, the study expected a positive relationship between liquidity and performance of banks.

Bank Size

The size of a company is the amount and variety of production capacity and ability a company possesses or the amount and variety of services a company can provide concurrently to its customers (Jonsson, 2007). Compared to small banks, larger banks are able to produce the services more cheaply because they have achieved more learning and greater cumulative experience and they are able to spread their fixed costs over a greater amount of production and this is known as economies of scale.

A Priori Expectations

Table 1 depicts the expected signs of the independent variables based on theoretical and empirical literature discussed

Table 1: Summary of measurements and A Priori expected signs of the independent variables

Variables	Expected signs
CAR	+
Deposit Ratio	+
Liquidity	+
Bank Size	+

Source: Authors construct (2020)

Data processing Tool and Estimation Strategy

The study employed panel design because the data structure contained both time series (years) and cross-sectional dimensions (the firms). The data was processed by Stata version 13.0 and the study employed the random effect estimator based on the results from the Hausman tests. The choice of either fixed effects or random effects depended on the results from the Hausman test. Wooldridge (2010) explained the basic structure of fixed effect approach to panel data analysis. The fixed effect estimator uses time- demeaning approach to eliminate the unobserved firm specific effects, which may be correlated with the independent variables. Thus, once the unobserved effects are eliminated, all endogeneity issues or measurement errors in the panel structure will be removed (Verbeek, 2004). This means that fixed effect estimators require a formal test of serial correlation to verify the efficiency of the estimations.

One of the main assumptions of the fixed effect estimator is that the unobserved effect α_1 does not correlate with the independent variables. Once they are correlated, the random effect models become the most efficient estimator (Wooldridge, 2010). Sometimes, the panel data structure has missing values. Such panel data structure is referred to as unbalanced panel whilst that which does not have any missing values is referred to as balanced panel.

Wooldridge (2010) suggests that empirical estimates normally favours the result of random effects when the panel structure is unbalanced based on the assumption that the unobserved term is uncorrelated with the independent variables. Therefore, aside the Hausman test, the random effect estimations were chosen because on missing values in the panel data structure. However, in practice, most researchers estimate both fixed and random effect models and

choose between them based on the Hausman test. The null hypothesis of the Hausman test is that the unobserved term is uncorrelated with the independent variables. Thus, the null hypothesis is rejected, the fixed effect estimates are more efficient and the vice versa means that the random effect estimates are more efficient.

Diagnostics

Test for Multicollinearity

Multicollinearity refers to a situation in which two or more independent variables are highly related. When there is presence of multicollinearity, it means the regression estimated may have large variances, leading to an artificial high R square and this makes the results unreliable. Gujarati (2003) noted that the presence of multicollinearity is not as much a problem as its severity. Thus, this study employed a correlation matrix to access the issues of multicollinearity.

Test of Joint significance

One vital assumption underlying regression models is the assumption of joint significance of the independent variables. Thus, to access whether all the independent variables were able to jointly predict the dependent variable, a Wald test was performed. The null hypothesis of this test is that the independent variables jointly cannot predict the dependent variable against the alternative that the independent variables jointly can predict the dependent variable

Variables Measurement and Sources

The study employed secondary data for the analysis. Data for study were retrieved from the annual financial statements of the banks. Data again span from 2008 – 2016 and the choice of the time period was informed by data

availability. The selection of banks was purposively done and included all banks with data on CAR, NPAT and ROCE from 2008 to 2018. Although longer durations give a better insight into the association between the explained and explanatory variables, this study could rely on eleven years due to data unavailability. In line with existing literature, the variables, their measurement as well as their sources are summarised in the table below:

Table 2: Variable Source and Description

Variable	Measurement	Source
Performance	Net Profit After Tax Return on Capital Employed	Annual Report of licensed banks, 2008-2018
Capital Adequacy Ratio	Bank capital/ risk-weighted assets.	Annual Report of licensed banks, 2008-2018
Deposit Ratio	Ratio of deposits that banks keep and do give out as loans	Annual Report of licensed banks, 2008-2018
Liquidity	Ratio of current assets divided current liabilities.	Annual Report of licensed banks, 2008-2018
Firm size	Logarithm of total assets	Annual Report of licensed banks, 2008-2018

Source: Author's construct

Summary

This chapter presented the research methods employed in conducting the study. The study is based on the quantitative research approach. The study also employed explanatory research design as it seeks to explain the relationships between capital adequacy and bank performance. The study mainly employed fixed effect and random effect estimation based on the Hausman test.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents and discusses the results obtained from the empirical analysis. Descriptive statistics on all variables employed in the study are also presented to give an idea of the performance of licensed banks. A correlation matrix, which aims to avoid issues of multicollinearity in the empirical specification, is also presented in the chapter. Subsequently, the chapter presents formal discussions on the various models estimated in the study.

Descriptive Statistics

Descriptive statistic are presented on a sample of 21 banks licensed on the Ghana Stock Exchange. The descriptive statistics presented in this section is the mean, which is the measure of average, the standard deviation which is the measure of degree of variability, the minimum and the maximum values for each variable, as well as the number of observations.

Descriptive Statistics

Table 3 : Descriptive Statistics of the Regress and the Regressors

Variable	Obs	Mean	Std.Dev.	Min	Max
ROCE	194	0.652	0.479	0.118	0.758
NPAT	192	0.892	0.059	0.732	0.964
CAR	193	0.187	0.062	0.067	0.568
DEPRAT	201	0.898	0.187	0.333	0.998
LIQUIDITY	201	0.220	0.886	0.120	0.923
SIZE	201	5.789	4.022	4.240	9.281

Source: Field Data (2020)

From the descriptive statistics, the Return on capital employed had an average of 0.652 within the limits of 0.118 and 0.758. This shows that overall, the sampled licensed companies have a slightly above average performance when it comes to return on capital employed. Similarly, the log of net profit after tax had an average of 892 within the limits 732 and 964. Also, the average capital adequacy ratio of the banks was 18.7% within the limits 6.2% and 56.8%. The deposit ratio had an average of 0.898 within the limits 0.333 and 0.998. Liquidity had an average of 0.220 with the limits 0.120 and 0.923. Finally the bank size had an average of 5.789 within the limits 4.022 and 9.281.

Correlation Analysis

Table 4 : Correlation Matrix

	ROCE	NPAT	CAR	DEPRAT	LIQUIDITY	SIZE
ROCE	1.0000					
NPAT	0.7688	1.0000				
CAR	0.6548	0.4972	1.0000			
DEPRAT	0.0845	0.3986	-0.1929	1.0000		
LIQUIDITY	0.0153	0.4259	-0.1193	-0.2300	1.0000	
SIZE	0.1390	0.2151	0.1924	-0.1137	0.2049	1.0000

Source: Field Data (2020)

ROCE represents return on capital employed, NPAT represents the log of Net profit after tax, CAR represents Capital Adequacy Ratio, DEPRAT represents deposit ratio, Liquidity represents liquidity and SIZE represents the bank size.

Table 4 presents the pairwise correlation matrix for all the variables employed in the empirical analysis. This depicts the varying relationships among the variables and the direction of the relationships (Adam, 2018).

Regression results on the relationship between Capital Adequacy and Bank Performance

This subsection present and discusses the empirical results on the objectives of the study. The results of the regression that estimates the relationship between capital adequacy ratio and Bank performance for the full sample is first presented. Thereafter the results of the regression that estimates the relationship between capital adequacy ratio and bank performance is presented for a subsample of weaker banks, and finally the regression that estimates the relationship between capital adequacy and Bank performance for stronger banks.

Table 5: Relationship between Capital Adequacy ratio and Bank performance for full sample

Results	**Model 1**	**Model 2**
Dependent Variable:	**NPAT**	**ROCE**
CAR	0.056**	- 0.014**
	(0.017)	(0.006)
DEPRAT	9.039*	6.608*
	(4.569)	(2.980)
LIQUIDITY	6.607*	34.42**
	(3.340)	(10.58)
SIZE	13.87*	176.8*
	(7.012)	(70.79)
_cons	70.01	-27.51*
	(39.68)	(13.3)
N	169	167
R Square	0.8091	0.9707
Adj. R Square	0.769	0.948
Wald Chi^2	35.65	99.48
P>Chi^2	0.000	0.000

***, **, * denotes significance at 1%, 5% and 10% respectively. Standard errors in parentheses.
Source: Field Data (2020)

ROCE represents return on capital employed, NPAT represents the log of Net profit after tax, CAR represents Capital Adequacy Ratio, DEPRAT represents deposit ratio, Liquidity represents liquidity and SIZE represents the bank size.

Table 5 presents the regression result on model that estimates the effect of capital adequacy on bank performance. Model 1 specifically reports the results on the relationship between capital adequacy ratio and Bank performance when net profit after tax is used as the dependent variable and model 2 specifically reports the results on the relationship between capital adequacy ratio and bank performance when return on capital employed is employed as the dependent variable.

The result from Model 1 depicts that, at 5% significance level, capital adequacy ratio has a significant positive effect on net profit after tax. This implies that, cetaris paribus, the higher a bank's capital adequacy ratio, the higher its performance will be in terms of net profit after tax. The coefficient of 0.056 indicates that a 1% increase in level capital adequacy ratio will lead to 5.6% increase in net profit after tax. This is because being solvent helps banks to attract new customers and shareholders as well as maintain their existing customers. Such banks are also able to meet the credit requests of their clientele. Therefore, the result confirms the first hypothesis that there is a significant positive effect of capital adequacy ratio on Bank performance.

Thus the results is in line with that of Musyoka (2017) who found that capital adequacy considerably enhances the financial performance of commercial banks. The result is also in line with that of Ejoh and Iwara (2014) who established a positive significant relationship between capital adequacy and the bank's profitability. Again the results corroborates that of Okoye at al.

(2017) who found a positive effect of capital adequacy on the performance of licensed banks.

The result from Model 2 depicts that, at 5% significance level, capital adequacy ratio has a significant negative effect on return on capital employed. This implies that, cetaris paribus, the higher a bank's capital adequacy ratio, the lower its performance will be in terms of return on capital employed. The coefficient of -0.014 indicates that a 1% increase in level capital adequacy ratio will lead to 1.4% decrease in return on capital employed. This is because even though capital adequacy ratio may enhance bank profitability, it may not be sufficient to enhance it return on capital employed because in an attempt to expand the capital base to increase capital adequacy, the banks will end up reducing their returns on capital employed.

Therefore, the results corroborates with that of Li and Zou (2014) who found a negative effect of capital adequacy on return on capital provided by equity holders. Again, the results corroborates with that of Dreca (2013) who found that capital adequacy significantly influence the level of profitably. Similarly, the results are in line with that of Allen, Nilapornkul, and Powell (2013) who found capital adequacy had negative effects on profitability. However, the result is not in line with that of Musyoka (2017) who found that capital adequacy enhances the financial performance of commercial banks.

Regression results on the relationship between Capital Adequacy and Bank Performance for the sub-sample of weaker banks

The results of the regression that estimates the relationship between capital adequacy ratio and Bank performance for the sub sample of weaker banks is presented in this section. Following the argument of Okafor,

Ikechukwu and Adebimpe (2010), weaker banks are banks that have problems in keeping up with the capital adequacy requirement**.** Thus in this section, results of the regression that estimates the relationship between capital adequacy ratio and bank performance is presented for a subsample of weaker banks. Weaker banks here are defined as banks that have capital adequacy below that of the average capital adequacy ratio of the full sample. There were 8 Banks out of the full sample of 21 banks.

Table 6: Relationship between Capital Adequacy ratio and Bank performance for sub-sample of weaker banks

Results	**Model 3**	**Model 4**
Dependent Variable:	**NPAT**	**ROCE**
CAR	- 0.026*	- 0.019**
	(0.017)	(0.006)
DEPRAT	9.139*	6.621*
	(4.569)	(2.980)
LIQUIDITY	5.607*	30.21**
	(3.410)	(9.99)
SIZE	11.87*	173.8*
	(6.128)	(82.79)
_cons	50.01	-22.68*
	(43.68)	(11.3)
N	68	67
R Square	0.990	0.5092
Adj. R Square	0.879	0.497
Wald Chi^2	39.65	49.37
P>Chi^2	0.000	0.000

Standard errors in parentheses
Source: Field Data (2020)

ROCE represents return on capital employed, NPAT represents the log of Net profit after tax, CAR represents Capital Adequacy Ratio, DEPRAT represents deposit ratio, Liquidity represents liquidity and SIZE represents the bank size.

Model 3 specifically reports the results on the relationship between capital adequacy ratio and Bank performance for a sub-sample of weaker banks

when net profit after tax is used as the dependent variable and model 4 specifically reports the results on the relationship between capital adequacy ratio and bank performance when return on capital employed is employed as the dependent variable for the sub sample of weaker banks.

The result from Model 3 depicts that, at 10 % significance level, capital adequacy ratio has a significant negative effect on net profit after tax. This implies that, cetaris paribus, the higher a weaker bank's capital adequacy ratio, the lower its performance will be in terms of net profit after tax. The coefficient of - 0.026 indicates that a 1% increase in capital adequacy ratio will lead to 2.6% decrease in net profit after tax. This is because insolvent or weaker banks may not be able to attract new customers and shareholders as well as maintain their existing customers.

The result from Model 4 depicts that, at 5% significance level, capital adequacy ratio has a significant negative effect on return on capital employed. This implies that, cetaris paribus, the higher a bank's capital adequacy ratio, the lower its performance will be in terms of return on capital employed. The coefficient of -0.019 indicates that a 1% increase in level capital adequacy ratio will lead to 1.9% decrease in return on capital employed of weaker banks.

This is because even though capital adequacy ratio may enhance bank profitability, it may not be sufficient to enhance it return on capital employed because in an attempt to expand the capital base to increase capital adequacy, the banks will end up reducing their returns on capital employed. Therefore the results corroborates with that of Li and Zou (2014) who found a negative effect of capital adequacy on return on capital provided by equity holders. Again, the

results corroborates with that of Dreca (2013) who found that capital adequacy significantly influence the level of profitability.

Regression results on the relationship between Capital adequacy and Bank Performance for the sub-sample of stronger banks

The results of the regression that estimates the relationship between capital adequacy ratio and Bank performance for the sub sample of stronger banks is presented in this section. Following the argument of Okafor, Ikechukwu and Adebimpe (2010), stronger banks are banks that do not have problems in keeping up with the capital adequacy requirement**.** Thus, in this section, results of the regression that estimates the relationship between capital adequacy ratio and bank performance is presented for a subsample of stronger banks. In this study, stronger banks are operationally defined as banks that have an average capital adequacy above that of the average capital adequacy ratio of the full sample. There were 13 banks out of the full sample of 21 banks.

Table 7: Relationship between Capital Adequacy ratio and Bank performance for sub-sample

Results	**Model 5**	**Model 6**
Dependent Variable:	**NPAT**	**ROCE**
CAR	0.096***	0.012***
	(0.017)	(0.006)
DEPRAT	10.039**	6.608**
	(4.690)	(2.180)
LIQUIDITY	5.672*	35.89**
	(2.312)	(11.99)
SIZE	12.871**	146.8*
	(6.123)	(71.78)
_cons	10.01	-27.51*
	(9.68)	(13.3)
N	100	101
R Square	0.7072	0.5990
Adj. R Square	0.691	0.593
Wald Chi^2	36.62	39.88
P>Chi^2	0.000	0.000

Standard errors in parentheses

ROCE represents return on capital employed, NPAT represents the log of Net profit after tax, CAR represents Capital Adequacy Ratio, DEPRAT represents deposit ratio, Liquidity represents liquidity and SIZE represents the bank size.

Source: Field Data (2020)

Table 7 presents the regression result on the effect of capital adequacy ratio on bank performance for a subsample of stronger banks. Model 5 specifically reports the results on the relationship between capital adequacy ratio and Bank performance for a subsample of stronger banks when net profit after tax is used as the dependent variable and model 6 specifically reports the results on the relationship between capital adequacy ratio and bank performance when return on capital employed is employed as the dependent variable for the sub sample of stronger banks.

The result from Model 5 depicts that, at 1% significance level, capital adequacy ratio has a significant positive effect on net profit after tax. This implies that, cetaris paribus, the higher a stronger bank's capital adequacy ratio, the higher its performance will be in terms of net profit after tax. The coefficient of 0.096 indicates that a 1% increase in capital adequacy ratio will lead to 9.6% increase in net profit after tax.

This is because these stronger banks are normally solvent and this enables them to attract in new customers and shareholders as well as maintain their existing customers. Such banks are also able to meet the credit requests of their clientele. Therefore, the result confirms the first hypothesis that there is a significant positive effect of capital adequacy ratio on Bank performance.

The result is also in line with that of Ejoh and Iwara (2014) who established a positive significant relationship between capital adequacy and the

bank's profitability. Again the results corroborates with that of Okoye at al. (2017) who found a positive effect of capital adequacy on the performance of licensed banks.

The result from Model 6 depicts that, at 1 % significance level, capital adequacy ratio has a significant negative effect on return on capital employed. This implies that, cetaris paribus, the higher a stronger bank's capital adequacy ratio, the higher its performance will be in terms of return on capital employed. The coefficient of 0.012 indicates that a 1% increase in level capital adequacy ratio will lead to 1.2 % increase in return on capital employed of stronger banks. This is because for stronger banks, even though they may have a large capital base, they are attractive enough to attract more customers and attain more profitability.

The result is in line with that of Ejoh and Iwara (2014) who established a positive significant relationship between capital adequacy and the bank's profitability. Again the results corroborates with that of Okoye et al. (2017) who found a positive effect of capital adequacy on the performance of licensed banks.

Results of control variables and Bank Performance

In all the models presented in Table 5, 6 and 7, deposit ratio had a significant positive effect on bank performance. Thus the results is in line with Okun (2012) did a study on the effect of level of deposits on financial performance of Commercial Banks in Kenya and established that a positive and significant relationship between deposits ratio and bank performance.

Again, for all the models presented in both Table 5,6 and table 7, liquidity had a significant positive effect on bank performance. The results are

in line with Kijjambu (2015) who found that increase in liquidity enhances bank performance.

Finally, for all the models presented in both tables 5, 6 and 7 , bank size had a positive effect of bank performance. The results is in line with Jonsson (2007) who argued that as compared to small banks, larger banks are able to produce the services more cheaply because they have achieved more learning and greater cumulative experience and they are able to spread their fixed costs over a greater amount of production and increase their performance.

Diagnostics of the results

Test of Joint Significance

One vital assumption underlying regression models is the assumption of joint significance of the independent variables. Thus, to access whether all the independent variables in Table 5, 6 and Table 7 were able to jointly predict the dependent variable, a Wald test was performed. The null hypothesis of this test is that the independent variables jointly cannot predict the dependent variable. The p-values of the Wald test rejected this null hypothesis, which means that all the independent variables in each model jointly explain their dependent variable respectively. This therefore means that all the R-square values in Tables and are significant.

Interpretation of the R Square

In model 1, 80.91% variation in the bank's NPAT can be explained by the variation in the regressors. In model 2, 97.07 % variation in the bank's ROCE can be explained by the variation in the regressors. In model 3, 89.90 % variation in the bank's NPAT can be explained by the variation in the regressors. In model 4, 50.92% variation in the bank's ROCE can be explained by the

variation in the regressors. In model 5, 70.72 % variation in the bank's NPAT can be explained by the variation in the regressors. In model 6, 59.90 % variation in the bank's ROCE can be explained by the variation in the regressors.

Chapter Summary

The descriptive statistics revealed that in all, the sampled licensed banks have an above average level of performance. Also, the regression results revealed that generally capital adequacy ratio had a positive significant effect on bank performance when NPAT is used as the measure of performance and has a negative effect of performance when ROCE is used as a measure of performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter begins by presenting a summary of the research and more specifically the findings of the study. Further, this chapter concludes on the effect of capital adequacy ratio on net profit after tax as well as the effect of capital adequacy ratio on return on capital employed. Finally, the chapter makes recommendations for both policy and future research.

Summary of the Research

The motivation for the study is that prior to 2009, most the studies on banking risk focused on rural, small and just few bigger banks (Dermerguc-Kunt & Huzingha, 2011). Also, most empirical studies assessing the relationship between capital adequacy and bank performance in Ghana have focused on return on assets and return on equity as measures of performance.

The study sought to examine the effect capital adequacy has on bank performance, by employing net profit after tax and return on capital employed as measures of performance. As a theoretical bases for the study Buffer Theory of Capital Adequacy and the efficiency structure theory were discussed and linked to this study. This was followed by an empirical review of existing literature in line with the objectives of the study.

The study employed the quantitative approach and the explanatory research design since numerical values and models were used to estimate the causal relationship between capital adequacy ratio and profitability of licensed commercial banks in Ghana. The units of analyses were 21 commercial banks in Ghana who had data available and the data span was from 2013 to 2018. The

choice of these institutions was mainly influenced by the availability of data. Finally, the study mainly employed fixed effect and random effect estimation based on the Hausman test.

Summary of Findings

A number of insightful and significant results that have good implications emerged from the findings of this study. The first objective of the study was to examine the effect of capital adequacy on Bank performance (Net profit after tax). The results confirmed that there is a significant positive effect of Capital adequacy ratio on bank performance. The second objective examined the effect of capital adequacy on Bank performance (return on capital employed). The results however rejected the hypothesis that there is a significant positive effect of Capital adequacy ratio on bank performance

First, the results reveal that the capital adequacy ratio generally increase bank performance in terms of net profit after tax. Again the results revealed that capital adequacy ratio generally decreases bank performance in terms of return on capital employed. This is because even though capital adequacy ratio may enhance bank profitability, it may not be sufficient to enhance it return on capital employed because in an attempt to expand the capital base to increase capital adequacy, the banks will end up reducing their returns on capital employed.

Conclusions

Based on the results from the study, some conclusions have been inferred.

- In relation to the first hypothesis, the study found that capital adequacy ratio positively influences profitability of banks (net profit after tax). This means

that to be profitable, it is a prerequisite for banks to maintain substantial capital adequacy levels.

- In relation to the second hypothesis, the study found that capital adequacy negatively influences bank performance in terms of return on capital employed. This is especially so for the weaker banks. This means that these banks need to also work on their efficiency in relation to their capital adequacy to remain profitable and sustainable.

Recommendations

Anchoring on the study findings, the researcher finds it imperative to make few recommendations and recommend areas for further research on the subject matter of the impact of capital adequacy ratio on bank performance. The following recommendations were therefore made in reference to the study area. Based on the results, the researchers hereby make the following recommendations;

- It is not enough for banks to hold adequate capital, banks must be ready to identify and assume risky activities commensurate with such capital, and this will help to enhance their performance.
- The strategy of merger and acquisition adopted by banks to meet up the new capitalization policy in line the Bank of Ghana directives will actually help banks to meet up the rule of capital adequacy which will eventually increase their performance.
- For effective performance, each bank should set its own benchmark depending on the desired safety level. Nothing stops the strong banks from setting their capital base beyond the minimum capital base of GHS 400 million specified by the bank of Ghana while the weak or small banks may

have their capital base lower than the minimum capital requirement as long as it is in line with their risk's exposures.

- An initiative approach to forecasting capital position into the future should be applied and numerous scenarios testing should be carried out. They will help banks to understand the underlining processes and dynamism of its industry as well as reliable predictions as regards to its capital needs. Also, Banks should also be able to establish linkage between risk, behaviour and incentives appropriate for the allocation of capital to engage in value creating activities and stock holding.

Suggestions for Future Research

First of all, other studies can extend this current study by examining the relationship between capital adequacy and bank performance for other banks apart from the 21 licensed banks employed here. Further studies could also examine the effect of capital adequacy on performance of financial institutions other than banks.

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