EFFECT OF CAPITAL REQUIREMENT ON PROFITABILITY AND LENDING BEHAVIOUR OF BANKS IN GHANA

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MAY, 2019
DECLARATION

This is to certify that, this dissertation is the result of my own research work and that no part of it has been presented for another degree in this University or elsewhere.

.................................................................  .................................................................
Andrew Semanu Apawudza                     DATE

(STUDENT)
CERTIFICATION

I hereby certify that this long essay was supervised in accordance with the procedures laid down by the University of Ghana.

................................................................. .................................................................

Prof. Lord Mensah DATE

(SUPERVISOR)
DEDICATION

I dedicate this work to God and my late parents
ACKNOWLEDGEMENT

I would like to express my profound gratitude to God for seeing me through the completion of my masters degree. I am very grateful to my supervisor, Prof. Lord Mensah for his professional contribution, guidance and advice towards this work. Also, I am very grateful to my uncle and wife, Mr. and Mrs. Afeti and children as well as all the lecturers in the Finance Department for their unflinching support throughout my masters degree. Finally, I wish to thank my fiancée, Eleanor Banson for her support. I say may the almighty God bless you all immensely.
ABSTRACT

Minimum capital requirement is significant in improving banks’ performance and minimizing the lending behaviour, thus it is vitally important to regulate financial institutions such as bank in order for them not take on excess leverage and become insolvent. The objective of this study is to assess the effect of minimum capital requirement on profitability and lending behavior of banks in Ghana. The study employs pooled panel data analysis with quantitative research approach, as well as purposive sampling method to sample 12 banks in Ghana. The study used financial statements of twelve banks comprising of 6 listed and 6 unlisted banks in Ghana during the period 2011 to 2017, and the data collected was coded and entered into STATA version 15 and analysed using Pearson correlation and panel data analysis. The study found that fixed effect model was preferred over the random effects model for the determination of variation in the profitability and lending behavior of banks in Ghana due to the minimum capital requirement using the Hausman Test.

The study found a positive effect of capital requirement on profitability of banks in Ghana. Also, the study found a negative effect of capital requirement on the lending behavior of banks in Ghana.

The study recommends that bank managers should intensify their effort of enhancing the banks’ profitability by ensuring that there is enough capital to prevent liquidation. Banks should put in some policies and systems to manage their lending behaviours. Banks managers should separate honest customers facing short term loan payment problems from habitual defaulters.
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CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Developments over the past decade in the banking sector has prompted the Central Bank on the need to strengthen both the supervisory and regulatory framework to create a more robust banking sector by beginning an exercise aimed at totally reforming the banking sector. Following the financial crises in the last decade, many countries including Ghana, have implemented stricter rules for their banking sectors to ensure stability of their banks. The rationale behind this is that the stability of the banking sector of a country plays a vital role in the growth of the economy of the country. Hence, the failure of banks impacts the economy negatively (Ramadan et al., 2011).

All over the world, banks are regulated to help ensure that they remain safe and sound to perform their critical role in the economy (Narh, 2013). Appropriate regulation ensures that banks operate with the rights amounts of high-quality capital contributed by their shareholders, in order to support the risks that they assume in accepting and managing deposits, lending, and other banking services they provide to their customers (Naceur & Omran, 2011). Simply put, banks must have the financial strength to meet their obligations to their depositors and other customers as and when they fall due (Bernard & Michael, 2014).

Quite recently, the Ghanaian banking sector experienced some turbulence which resulted in the Central Bank initiating certain reforms in the industry. The most significant being all Universal banks required by a minimum capital directive issued by the Bank of Ghana on 11th September 2017 to increase their minimum paid-up capital to GHC400 million by 31st December 2018.
(Bank of Ghana, 2018). At the end of the recent banking reform which was undertaken over a period of two years, the Ghanaian banking sector is left with 16 banks successfully recapitalized, 3 other banks merging with 5 banks and obtaining bailout from the government and 1 voluntarily exiting the industry (Bank of Ghana, 2019). The introduction of the bank recapitalization policy in 2018 by the Bank of Ghana was motivated by the need to encourage careful management of banks.

Determined, presumably, to foster a reformed, resilient and sustainable financial sector, the Central bank introduced a higher minimum capital requirement for banks. This policy is premised by comparable recapitalization policies in other jurisdictions. One of such cases is Malaysia. After financial crises in Asia, Malaysia commenced a similar recapitalization exercise which saw 80 banks reduced to 12 within a period of 2 years. South Africa’s case is another example which led to the consolidation of a number of banks in the industry in 2003 which resulted in a significant reduction in the number of banks (Akomea & Adusei, 2013). The recapitalization exercise in Nigeria is one that presents a better reference for the impact of bank consolidation in Ghana. In the case of Nigeria, 89 banks existed in the banking industry before the recapitalization and banking reform exercise in 2004. After, 14 banks had their licenses revoked and the remainder consolidated resulting in 25 banks by 2005.

Before the recent re-capitalization, the Ghanaian banking industry saw an adjustment of the minimum regulatory requirement in the banking sector in 2013. This adjustment resulted in an increase from of the minimum capital of banks from GH¢60 million to GH¢120 million. These increments in capital requirement in the banking sector was expected to drive growth, foster competition between banks within the industry, create well-resourced, profitable and efficient
banking institutions, and also reduce high lending rates within the industry. Bank capitalization is identified to affect the lending behavior of banks owing to imperfections in the market for debt. Specifically, capital requirement affects the ability of banks to raise uninsured form of debt (Leonardo & Paolo, 2013).

The question remains if the Central bank was able to achieve any or all of these targets. Another one lingers as to whether high bank recapitalization is enough to avert another banking crisis? In the near future and at what cost? The effect of high recapitalization is the topic of many current discussions. It is unclear how recapitalization will influence the probability of banks, the elements of the banking sector, or business cycle variations in credit.

1.2 Statement of the Problem

Low capitalization is a prevailing characteristic of the banking sector in Ghana. This has affected investment of banks in big projects as they lack the required financial power to invest in industries like the up-coming oil industry that require higher funds (Ametei, 2014). Recapitalization of banks causes structural changes which have associated merits and demerits. There were notable structural changes in the banking sector of the US between 1975 and 1997, as a result of recapitalization resulting in the reduction of commercial banks by about 35% (Angelini & Cetorelli, 2000). The relationship between banks and their customers can change because of the larger banks that are created through recapitalization (Akomea & Adusei, 2013). According to Dymski (2002), the consolidation of the banking sector led to the creation of larger banks which charge higher fees, pay lower interest on deposits and grant fewer loans to SMEs than the much smaller banks.

The few studies (Aboagye, 2012; Boahene, Dasah, & Agyei, 2012; Narh, 2013) done in Ghana on bank capitalization and performance, only looked at the relationship between capital and
performance and the determinants of banks’ profitability (Naceur & Omran, 2011). There is no clear study that tried to find the effect of the increases in the minimum capital requirements of universal banks in Ghana on their profitability and lending behaviour. Also, most of the studies undertaken in the area of bank recapitalization and profitability been conducted in large corporate developed and advanced economies, as opposed to developing countries such as Ghana, hence the need for this study.

This particular study, therefore intends to reduce the knowledge gap in the extant literature by specifically concentrating on the effects of the minimum capital requirements on the profitability and lending behaviour of selected universal banks in Ghana.

1.3 Objective of the Study

The main objective of the study is to examine the effect of the minimum regulatory capital requirements on the profitability and lending behaviour of banks in Ghana.

1.3.1 Specific Objectives of the Study

In order to achieve the main objective of the study, the following specific objectives have been outlined:

i. To examine the effect of minimum regulatory capital requirement on the profitability of banks in Ghana

ii. To examine the effect of minimum regulatory capital requirement on the lending behavior of banks in Ghana.

1.4 Research Questions

The research questions that guided the investigation of the study are:

i. What is the effect of minimum regulatory capital requirement on the profitability of banks in Ghana?
What is the effect of minimum regulatory capital requirement on the lending behavior of banks in Ghana?

1.5 Significance of the Study

The study will make the following contributions to academia, practice, and policy. Firstly, the study will add to the extant literature on minimum capital requirements and the profitability of banks, thereby serving as a reference material for future researchers. Also, the study would thus enlighten researchers, bankers, economists and students of banking and finance by providing an adequate store of knowledge about the minimum capital requirements, profitability, and lending behaviour of banks. Furthermore, the research will help the banking industry appreciate the implications of the regulatory increase in the paid-up capital of universal banks on their performance and profitability.

Lastly, it is expected that the findings of the study will serve as a policy guideline to the regulator, which is the Bank of Ghana in this regard. The Bank of Ghana will come out with efficient policies on how the universal banks can cope with the new increase in the minimum capital requirements.

1.6 Scope of the Study

The scope of the study was limited to universal banks, 6 of which are listed on the Ghana Stock Exchange and 6 of which are not listed, as at the end of December, 2017. Using mainly, secondary data sources, this will be obtained from published financial statements of the banks under study. The time frame for the data used within the study will be a period of (7) years (2011 to 2017). The process of collecting the secondary data for the universal banks listed on the exchange, might affect the data itself. Methodologically, the descriptive and panel data analysis approach was adopted to achieve the stipulated research objectives.
1.7 Organization of the Study

The study was organized into five main chapters as outlined below. Chapter One was the introductory chapter, which comprises of the background of the study, the problem statement, and the specific objectives of the study. It further stated the research questions, significance of the study, the scope of study, and the organization of the study. Chapter two reviewed the relevant theoretical, conceptual, and empirical studies on the minimum capital requirements, profitability, and lending behaviour of banks.

Chapter three presented the methodology of the study. The chapter outlined in detail, research design, target population, sample size, sampling techniques, sources of data collection, and the statistical tools that were used in the data analysis. Chapter four presents the results and discussions of the study. Chapter five presented the summary, conclusion, and recommendations of the study.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter brings to bear the information from other researchers who have carried out their research in the same field of study. The specific areas covered here are the theoretical, conceptual, and empirical studies on the effect of the minimum capital requirements on profitability and lending behavior of banks.

2.1 Theoretical Literature

Different theories have been propounded in the extant literature that can be used to explain the relationship between the minimum capital requirements and the profitability of universal banks in Ghana. This section therefore reviews some of the theories in this regard. The theoretical principles underlying bank recapitalization in Ghana, and its effect on profitability can be described in terms of four (4) main theories, including the signaling hypothesis theory, the expected bankruptcy cost hypothesis theory, the risk-return hypothesis theory, and the theory of banking regulation.

2.1.1 The Signalling Theory

The signalling hypothesis suggests that a higher capital is a positive signal to the market value of a bank (Saona, 2011). As Trujillo-Ponce (2013) observed, under the signalling theory, bank management signals private information that the future prospects are very good by increasing capital. Thus, a lower leverage indicates that banks perform better than their competitors who cannot raise their equity without further deteriorating the profitability (Saona, 2011).
2.1.2 Expected Bankruptcy Costs Theory

Unlike the signalling hypothesis theory, the expected bankruptcy hypothesis theory argues that in a case where bankruptcy costs are unexpectedly high, a bank holds more equity to avoid a period of distress (Berger & Bouwman, 2013). The extant empirical literatures further points to the fact that, both the signalling hypothesis theory and the expected bankruptcy costs theory support a positive relationship between capital adequacy and profitability (Sufian, 2011).

However, the risk-return hypothesis theory suggests that increasing risks, by increasing the leverage of the firm, can lead to higher expected returns (Sufian, 2011). Therefore, if a bank expects increased returns (profitability) and takes up more risks, by increasing leverage, the equity to asset ratio (represented by capital) will be reduced (Ibrahim, Mohammed, & Gani, 2012). Thus, the risk-return hypothesis predicts a negative relationship between capital and profitability (Berger & Bouwman, 2013).

2.1.3 The Theory of Banking Regulation

Banking regulation is seen by many research experts as exogenous to the financial services industry in every country (Naceur & Omran, 2011). However, the operations of all banks, whether directly or indirectly require some form of regulation. The main regulatory authority in Ghana is Bank of Ghana. Narh (2013) asserts that banks’ regulation is due to the fact that, the operations of banks which is mostly qualitative asset transformation makes them inherently insolvent and illiquid. Money and its value; the key raw material of the financial services industry, to a large extent is both defined and determined by the nation or state through the regulatory authorities. According to Akrong (2017), the soundness of the Ghanaian banking system in particular, and the financial services industry as a whole, as well as the enactment of
industrial, financial, and fiscal policies are regarded as the main reasons to regulate the financial services industry. Regulation of financial intermediaries, especially, that of universal banks can also be costly (Olalekan & Adeyinka, 2013). There are the direct costs of administration and of employing supervisors, and there are also the indirect costs of distortions generated by monetary and prudential supervision (Narh, 2013). Banking regulation in some countries may even generate some form of rent for the regulated commercial banks, since it may hamper market entry as well as its exit. This theory is highly applicable to the effect of the regulatory minimum increase in the capital requirements of universal banks in Ghana.

2.2 Minimum Capital Requirement in Ghana

Historically, the Bank of Ghana (BoG) has revised the minimum capital levels for banks in response to developments in the banking industry and the economy at large. In 2003, the minimum capital requirement was raised from GH¢2.5 million to GH¢7.0 million to enable all banks convert to universal banks. The minimum capital requirement was also increased to GH¢60 million in 2007. In 2013, BoG again raised the minimum capital requirement to GH¢120 million for new entrants and advised existing banks to take steps to increase their capital in line with their risk profiles. BoG issued a Minimum Capital Requirement Directive in September 2017, increasing the minimum capital requirement for all banks to GH¢400 million from GH¢120 million. Banks are required to meet this requirement by December 2018 through the injection of fresh equity capital. The recent GH¢400 million minimum capital increase was deemed necessary because the solvency of most banks was threatened by poor asset quality, leading to significant impairments of capital, align banks’ capital base more closely with macroeconomic realities, and for good corporate governance.
2.3 Concept of Minimum Capital Requirement

Capital requirement is the amount of capital held by financial institutions such as banks as required by the financial regulator (Hellmann, Murdock, & Stiglitz, 2000). It is also referred to as capital adequacy or regulatory capital or capitalization. Capital requirement is mostly computed as capital adequacy ratio of equity that must be held as percentage of risk-weighted assets (Altman & Sabato, 2005). The purpose of capital requirement is to ensure that the financial institutions such as bank do not take on excess leverage and become insolvent. Capital requirements govern the ratio of equity to debt, recorded on the liabilities and equity side of a bank’s balance sheet (Furfine, 2001).

Minimum capital requirement affects the reaction of credit supply to output shocks (Angelini, Neri, & Panetta, 2014). This effect depends upon the link between bank capital and risk-aversion. In the presence of a solvency regulation, banks maintain a higher level of capital just because their lending portfolios are riskier (e.g., Kim and Santomero, 1988; Rochet, 1992; Hellman, Murdock & Stiglitz, 2000). Well-capitalized banks or banks that have met the minimum capital requirement are more risk-averse because the implicit subsidy that derives from deposit insurance is a decreasing function of capital (e.g., Flannery, 1989; Gennotte & Pyle, 1991).

2.4 Concept of Lending Behaviour

Lending which may be on short, medium or long-term basis is one of the services that deposit money banks do render to their customers (Kashyap & Stein, 1994). Banks do grant loans and advances to individuals, business organizations as well as government in order to enable them embark on investment and development activities as a means of aiding their growth in particular or contributing toward the economic development of a country in general (Olokoyo, 2011).
However, banks decisions to lend out loans are influenced by a lot of factors such as the prevailing interest rate, the volume of deposits, the level of their domestic and foreign investment, banks liquidity ratio, prestige, and public recognition (Ayodele, 2014). Moreover, lending decision of banks depends on type of bank, the capital base, the deposit base and density of the deposit, the credit guidelines issued from time to time by the controlling authority, and internal policies of the banks since loans and advances (Barth, Caprio & Levine, 2013). This accounts for the highest percentage of the total assets of the banks. The main source of lending is deposit or money accepted from the depositor but the amount that would have to be lent is a certain percentage of the total deposited amount and the remaining is kept as a reserve for the purpose of maintaining its liquidity (Malede, 2014).

A bank capital channel is a direct influence of regulatory capital requirements on the supply of credit (Myers & Majluf, 1984; Stein, 1998; Calomiris & Hubbard, 1995; Cornett & Tehranian, 1994). If equity is sufficiently low (and it is too costly to issue new shares), banks reduce lending because prudential regulation establishes that capital has to be at least a minimum percentage of loans (Thakor, 1996; Bolton & Freixas, 2001; Van den Heuvel, 2002).

2.5 Concept of Profitability

Profitability is the ability for a bank to make profit from its operational activities (Olweny & Shiphо, 2011). Agha (2014) referred to profitability as the capability of a company to make profit. Banks determine profit by subtracting expenses from the revenue earned. Profitability is thus computed by incomes and expenses. Drucker (1999) declares that a company such as banks makes profits to continue operating. The fact that a company recorded a loss in a single financial year is not a justification to close down the company but a continuous recording of loss in consecutive years risk the sustainability of the company (Dunn, Kohlbeck, & Magilke 2009).
Agha (2014) stated that, profit is employed as a measure of financial performance of a company. The profitability position of banks was assessed using Return on Assets (ROA) and Return on Equity (ROE). The study used return on equity. Return on Equity (ROE) shows the extent to which banks are able to manage their own capital efficiently and effectively. It evaluates the profits of the banks derived from the investment of bank owners’ personal capital or shareholders of the bank. Ang & Ma (2001) declared that a higher ROE results in an increase in profit growth. ROE shows the maximization of the capital of its shareholders.

2.6 Empirical Studies on Minimum Capital Requirement and Profitability

Empirical studies have been conducted on the relationship between bank regulatory capital and profitability. The empirical review of the study is therefore undertaken by identifying similarities and differences across various economies studied in the extant literature by previous researchers. Several authors continue to analyze the inter-relationship between bank regulatory capital and bank profitability.

For example, Sufian (2011), examined the determinants of the profitability of banks in the Philippines during the period 1990 to 2005. In the study, Sufian (2011), found out that bank capitalization has a positive impact on bank profitability (ROE). They further argued that commercial banks in developing countries needs a strong capital structure, because it provides them the strength to withstand financial crises and offers depositors a better safety net in times of bankruptcy and distress and distress macroeconomic conditions. A later study on inter-country basis by Naceur & Omran (2011) showed that bank capitalization and credit risk have a positive and significant impact on bank’s net-interest margin, cost efficiency, and profitability. Their work which captures a longer period of 1988-2005 on Mena (Middle East and North African)
countries, using the linear dynamic panel data model analysis, is consistent with the findings of Sufian (2011), on a single country within almost the same period. Naceur & Omran (2011) also found that regulatory reform variables seem to have an impact on bank performance.

Ibrahim, Mohammed, & Gani (2012), did a study on recapitalization and bank performance in Nigeria. In their study, the time series data from a period of ten (10) years, from 2000 to 2009 was analyzed using an independent t-test. The results of the study found that the net interest margin and funding cost significantly increased during the post-recapitalization period (2005-2009), while the return on assets (ROA) significantly decreased after the recapitalization. Their results for the return on assets (ROA) are consistent with the results of Adegbaju and Olokoyo (2008). Another study on the 2004 recapitalization by Sani and Alani (2013) within the period of 2002 to 2008, used the Wilcoxon ranked test to test the generated hypotheses found that, the recapitalization exercise did not have any significant impact on the pre-tax profit, return on asset (ROA), earnings per share, and the dividends per share, but had a significant impact on the return on equity (ROE). Bernard & Michael (2014), used the ordinary least squares regression method to analyze Nigerian bank data from 2000 – 2011 and posited that the profit maximization drive of the Nigerian banks have had a counter-productive effect on bank capitalization. Again, the efforts of the Nigerian banks to maintain quality assets and remain in business normally erode their capital.

2.7 Empirical Studies on Minimum Capital Requirement and Lending Behaviour of Banks

Bridges et al. (2014) studied the impact of changing banks’ capital requirements on bank lending. They exploited changes in bank capital requirements by banking supervisors in the
United Kingdom between 1990 and 2011. They found that, following an increase in capital requirements, banks gradually rebuild the buffers they hold over the regulatory minimum so they remain constant. Secondly, in the year following an increase in capital requirements, banks, on average, cut (in descending order based on point estimates) loan growth for commercial real estate, for other corporates and for household secured lending.

Also, Jackson et al. (1999) reviews the empirical evidence on the impact of the 1988 Basle Accord by focusing on whether any increase in ratios was achieved by increasing capital or reducing lending. Their study found a positive effect of minimum capital requirement on bank lending.

### 2.8 Conceptual Framework

The study seeks to establish the causal relationship between Regulatory capital and the performance of banks in the case of this study Return on Equity (ROE) and the banks’ loan book.

With respect to capital structure of banks, Berger et al. (1995) suggested that minimum capital requirements do have inadvertent implications for banks. This is as a result of the fact that, with increased capital, usually causes banks to respond to the corresponding increase in equity-to-asset ratio which in turn raises the banks’ asset portfolio thereby placing the bank in a position of likely failure. The controversy concerning the impact of regulatory capital on banking outcomes persists despite the theoretical and empirical interests it has generated for several decades now. The strand of empirical literature linking these variables is mixed and even more in conflict than in the theory. For instance, while many studies reveal that a higher or stricter capital requirements reduce the profitability of future lending and/or banking efficiency (Repullo & Suarez, 2008), other studies on the other hand reveal that having a stricter capital requirement
improve cost efficiency and have a significant effect on bank allocative efficiency (Pasiouras et al., 2009; Fare et al., 2004; Barth et al., 2004).

**Figure 2.1: Conceptual Framework**

Author’s construct, 2019

2.9 Conclusion

This chapter was designed to review the previous studies on the effect of the capital requirement on the profitability and lending capital of banks. The in-depth review revealed that the concept of capital requirement, profitability, and lending behavior is not something new and there is a positive effect of the capital requirement on profitability of banks.
CHAPTER THREE

METHODOLOGY

3.0 Introduction

The previous chapter reviewed the theoretical, conceptual, and empirical studies on capital requirements, the profitability, and lending behaviour of banks. This chapter describes the methodology used to address the objectives of the study which were stated in chapter one. That is, this chapter explains the research design, the population of the study, the variable description, methods of data collection and analysis.

3.1 Research Design

A research design is a vital method in every research work. It helps the smooth flow of the research operations, thereby ensuring that the research is as efficient and effective as possible, providing maximal information with the minimum effort, cost of expenditure, and time (Babbie, 2015). In practical terms, a research design is a well formulated plan for the research. According to Hair, Money, Samuel, & Page (2012), it is an advance planning or procedure to adopt when collecting vital data and methods to be used in the data analysis.

The research design used in this study is a pooled panel data analysis. This research design consists of cross-sectional and time series data. Pooled panel data analysis is a kind of data analysis with constant intercepts and slopes (Gujarati & Porter, 2011). Atiyet (2012) stated that panel data provides the researcher with a large number of observations which increases the degree of freedom and reduces the collinearity among the explanatory variables.

In this study, both the cross section and times series data of banks are pooled together to satisfy the assumption that there is no significant cross section or temporal effects. The study employed pooled panel data analysis to examine the effects of capital requirements on the profitability and
lending behavior of banks in Ghana. The study also used the quantitative research approach which is shown in the form of ratios computed from the financial statements of banks in Ghana from 2011 to 2017.

3.2 Study Population
The population of a study comprises of the collection of all possible individuals, objects, firms or other measurement of interest (Ary, Jacobs, & Razavieh, 2012). The target population for the study comprises of all listed and unlisted banks in Ghana as at December, 2018 (Bank of Ghana Report, 2018). According to the Bank of Ghana Report for August 2018, there were thirty (30) universal banks in Ghana, and they constituted the target population for the current study.

3.3 Sampling Technique
The non-probability sampling technique, specifically, the judgmental or purposive sampling technique was adopted as the sampling technique for the study. The study is purposive because, only the listed and unlisted universal banks in Ghana who has been operating in Ghana, from 2011 to 2017 and whose financial statements are audited and available were considered for the purpose of the study. The purposive sampling technique was used to select banks because the variables of interest used for the data analysis which were extracted from the financial statements of these banks.

3.4 Sample Size
A sample of twelve (12) universal banks comprising of six (6) listed banks and six (6) unlisted banks operating in Ghana as at December 2017 was drawn from the target population of thirty (30) universal banks in Ghana. The listed banks are Access Bank (Ghana) Limited (ABG), CAL Bank Limited (CAL), Ecobank Ghana Limited (EBG), Standard Chartered Bank Limited (SCB),
GCB Bank Limited (GCB), and Societe Generale Ghana Limited (SOGEGH). The unlisted banks are Stanbic Bank Ghana Limited (SB), Barclays Bank Ghana Limited (BBL), Zenith Bank Limited (ZBL), Fidelity Bank Limited (FBL), Guaranty Trust Bank (Ghana) Limited (GT), and Prudential Bank Limited (PBL).

The above twelve (12) universal banks in Ghana constituted the sample size, out of the target population of thirty (30) universal banks in Ghana. This represents 40% of the total population, and is consistent with the proposition of Tabachnick & Fidell (2006), where a minimum of 5% of a defined target population is considered as an appropriate sample size in making generalization. Moreover, the sample unit chosen for the study was based on the availability of financial data and annual reports spanning a period of seven (7) years (2011-2017).

3.5 Sources of Data Collection

The study used the financial statements of twelve banks comprising of 6 listed and 6 unlisted banks in Ghana during the period 2011 to 2017. This period was selected to evaluate the minimum regulatory capital requirements of universal banks in Ghana. This period also provides recent time series observations of the recapitalization exercise for the existing banks and represents a period of major changes for the Ghanaian banking system; typified by the universal banking principle resulting from the enactment of the Banking Act, 2004 (Act 673). The data for the analysis were extracted from the annual audited financial statements of these banks available at bank of Ghana or these banks.
3.6 Description and Measurement of Variables

These variables used to measure the effect of minimum capital requirement on the profitability and lending behavior of banks in Ghana. These variables were grouped into dependent, independent and control variables.

3.6.1 Dependent Variable

The dependent variable used in the study was the profitability of banks which was measured using return on equity. Return on Equity (ROE) denotes the ratio of net profit to total equity. Return on Equity is used because it connects bank profitability to its asset base (Padachi, 2006). Return on equity measures the income earned on every banks’ shareholders capital. Shareholder’s capital is a key aspect of banks’ working capital. Several researchers have used return on equity to measure performance of banks (Darkwah et al., 2016). Also, lending behavior of banks is measured as loans to total deposits.

3.6.2 Independent Variable

Capital requirement (CapReq) was an independent variable used in the study. Capital requirement was measured as the ratio of shareholder’s fund to total assets. A lower capital ratio suggests a relatively risky position which shows that capital ratio has a negative effect on profitability (Berger & Udell, 1995). On the contrary, higher capital minimizes the cost of capital which results to a positive effect on profitability (Sufian & Chong, 2008). Also, banks with more capital engage are careful lending and minimize their funding cost (Altunbaş, Fazylov, & Molyneux, 2002). This is because, more share of capital is vital for creditworthiness. Two dummy variables were used to describe the minimum capital requirement exercise. They are represented by DumPer and DumCap.
DumCap denotes a dummy variable referring to a bank operating with the amount of capital stated for banks in the recapitalization directive even before the directive was issued. A bank operating with the stated capital (Ghc 120 million) or more before the recapitalization directive was issued in 2016 is denoted by 1 and 0 otherwise. That is,

\[ \text{DumCap} = \begin{cases} 1 & \text{if bank operates with GHS 120 million or more} \\ 0, & \text{otherwise} \end{cases} \]

DumPer denotes a dummy variable referring to the period for which the recapitalization was implemented. The period a bank operates upon enforcement of the statutory regulatory capital requirement, that is, from 2014 to 2016 is denoted by 1 and the period a bank operates without the enforcement of the statutory regulatory capital requirement, that is, from 2011 to 2013 is denoted by 0. That is,

\[ \text{DumPer} = \begin{cases} 1 & \text{if bank operates from 2014 to 2016 with capital requirement} \\ 0, & \text{otherwise} \end{cases} \]

3.6.3 Control Variables

Control variables are not the main variables of interest but are variables that also influence the dependent variable. They are held constant to establish the relationship between the independent and dependent variables. To examine the effect of minimum capital requirement on the profitability and lending behaviour of banks, control variables accepted in literature that are used in this study are bank size (SIZE), and bank growth (GROWTH), and leverage (LEV).

3.6.3.1 Bank Size

The bank size (SIZE) was measured as the logarithm of total assets at the end of the period (Petria, Capraru, & Ihnatov, 2015). Studies have shown in Africa that size of banks used as control variable has a negative effect on the profitability of banks (Petria, Capraru, & Ihnatov, 2015).
3.6.3.2 Bank Growth

Bank growth (GROWTH) is year on year change in interest income between current years. Studies have shown in Africa that bank growth used as control variable has a negative effect on the profitability of banks (Nazir & Afza, 2009)

3.6.3.3 Leverage

Leverage was measured as the total liabilities divided by total assets. Studies have shown in Africa that bank growth used as control variable has a negative effect on the profitability of banks (Deloof, 2003)

3.7 Data Analysis Techniques

This part describes the statistical tools used to analyze the data. The data collected was screened, edited and analyzed using STATA Version 15. Descriptive statistics was used to describe the variables used. Also, correlation analysis was used to analyze the degree of relationship between the variables and a panel analysis such as fixed and random effects was used to examine the causal relationship between the dependent variables (profitability and lending behavior of banks) and independent variable (capital requirement).

3.7.1 Correlation Analysis

Correlation denotes the linear relationship between two variables. It is used to measure the strength and direction of the relationship between two variables. The study used Pearson’s Correlation Coefficient to examine the association between all the variables in the study since the variables are measured on a continuous scale.

3.7.2 Regression Analysis

The study used panel data analysis to find the relationship between capital requirements and the dependent variables (profitability and lending behavior of banks). Panel data are characterized by
having repeated observations (years) on fixed entities (banks). The study used panel data comprising of specific feature of banks such as capital requirement which is cross-section and which changes over time.

3.7.2.1 Model Specification

To estimate the parameters of interest given panel data framework, one way is pooling all the cross-sectional and times series data without differentiating them and using any of the panel estimation models such as Ordinary least squares for fixed effects estimation or generalized least squares for random effects estimation (Wooldridge, 2010).

The unobserved effect model with \( m \) observed explanatory variables is given as:

\[
Y_{it} = \beta_1 X_{it1} + \beta_2 X_{it2} + \cdots + \beta_m X_{itm} + \gamma_1 Z_{it1} + \cdots + \gamma_n Z_{itn} + \alpha_i + \mu_{it}, t
\]

\[
= 1, 2, \ldots, T \quad (3.1)
\]

Let \( i \) represent the cross sectional unit and \( t \) represent the time period

\( \mu_{it} \) is the error term which changes over time and is influenced by \( Y_{it} \)

\( \alpha_i \) captures all the unobserved and time-constraint factors that influence \( Y_{it} \).

Specifically, this study model the effect of capital requirement on profitability and lending behaviour of banks using panel data analysis to acquire the estimates;

Model 1

\[
ROE_{it} = CapReq_{it} + SIZE_{it} + GROWTH_{it} + LEV_{it} + \alpha_i + \mu_{it}
\]

Model 2

\[
LB_{it} = CapReq_{it} + SIZE_{it} + GROWTH_{it} + LEV_{it} + \alpha_i + \mu_{it}
\]

In order for pooled ordinary least squares to generate a consistent estimator of \( \beta_j \), the model should satisfy the assumption that the unobserved effect, \( v_{it} = \alpha_i + \mu_{it} \) is uncorrelated with \( X_{itj} \).
Despite the no correlation between the idiosyncratic error $\mu_{it}$ and $X_{itj}$, the pooled ordinary least squares is biased and inconsistent if there is no correlation between $\alpha_i$ and $X_{itj}$ (Wooldridge, 2010).

**Fixed Effects Estimation**

Fixed effects model is another way of acquiring consistent estimation of $\beta_j$ while permitting the correlation between $\nu_{it}$ and the explanatory variables. The presence of the idiosyncratic errors, $\mu_{it}$ being serially correlated makes the fixed effect model the best criterion to analyze the panel data. The fixed effects model main aim is to remove $\alpha_i$ because it is correlated with one or more $X_{itj}$.

Fixed effects estimator is acquired by applying ordinary least squares to time demeaned transformation on the data. The main goal of ensuring that the estimator is consistent is strictly exogeneity assumption (Wooldridge, 2010).

**Random Effects Estimation**

The model in (3.1) becomes a random effects model when the unobserved effect $\alpha_i$ is uncorrelated with every explanatory variable.

$$\text{Cov}(X_{itj}, \alpha_i) = 0, t = 1,2, ..., T; j = 1,2, ..., k.$$  

The composite error term, $\nu_{it} = \alpha_i + \mu_{it}$ shows that it is serially correlated across time because of the presence $\alpha_i$ which is in every time period.

The random effects estimator is linked to the generalized least squares (GLS) estimator that considers the serial correlation:

$$\text{Cov}(v_{it}, v_{is}) = \frac{\sigma_{\alpha}^2}{\sigma_{\alpha}^2 + \sigma_{\mu}^2}, t \neq s$$

Where $\sigma_{\alpha}^2$ is the variance of $\alpha_i$ and $\sigma_{\mu}^2$ is the variance of $\mu_i$.  

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If the regressors satisfy strict exogeneity when there is no serial correlation or no unobserved effect, $\sigma^2 > 0$ and $\mu_{it}$ are non-autocorrelated and homoscedastic, random effect model will be efficient.

### 3.7.2.2 Choosing between Fixed Effects and Random Effects Model

A very significant concern when making a decision to select between fixed effects and random effects method is dependent on whether $\alpha_i$ is correlated with each of the explanatory variable, $X_{it}$. A test proposed by Haussman (1978) is used to choose between fixed effects and random effects model. According to Greene (2007), Haussman test compares one estimator which is consistent irrespective of whether the null hypothesis is true or not to another estimator which is only consistent under the null hypothesis. The null hypothesis is that, the error term is fixed against the alternative that the error term is random.

### 3.8 Conclusion

This chapter focuses on the methods to use to address the research questions. The study used pooled panel data analysis as the research method to examine the relationship between capital requirement and profitability as well as the relationship between capital requirement and lending behavior of banks in Ghana. The study used statistical test such as correlation analysis and panel data analysis to examine the relationship between the dependent variable and independent variables.
CHAPTER FOUR
RESULTS AND DISCUSSION

4.0 Introduction
This chapter presents the findings derived from the study. First, the study provides the descriptive statistics such as mean, standard deviation, skewness, and kurtosis of the variables used in the study. Secondly, this chapter presents the results of a correlation matrix which examines the degree of relationship between the explanatory variables used in the study. Thirdly, the chapter presents a regression analysis which shows the relationship between profitability of Ghanaian banks and the several explanatory variables employed. The study employed pooled ordinary least squares regression to determine the effect of several explanatory variables used in the study on profitability of banks.

4.1 Summary Statistics
This study begins the empirical investigation by presenting the summary statistics of profitability, lending behaviour, capital requirements, and the control variables. According to Rashid & Jabeen (2016), a summary statistics offer information concerning variable distribution. The summary statistics was estimated to offer an all-inclusive interpretation to the trend of profitability, lending behaviour, capital requirements, and control variables for the 12 sample banks. Table 4.1 presents the mean values, standard deviation, minimum and maximum values of the variables for 12 banks used in the study. Specifically, the mean value is a measure of the average of the underlying variables over the studied period. The standard deviation describes the amount of variation of a variable from the average mean. The minimum (Min) and maximum (Max) values show the lowest and highest value in the sample. The number of observation in the
study was 84. It can be seen from the value of the standard deviation that there is a considerable variation in the sample which is acceptable for the analysis of the data.

**Table 4.1: Summary Statistics of the Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>0.139237</td>
<td>0.012294</td>
<td>0.001680</td>
<td>0.161652</td>
</tr>
<tr>
<td>LB</td>
<td>0.215738</td>
<td>0.472911</td>
<td>0.029648</td>
<td>0.361403</td>
</tr>
<tr>
<td>CapReq</td>
<td>45.18137</td>
<td>11.04851</td>
<td>35.23885</td>
<td>60.00158</td>
</tr>
<tr>
<td>DumCap</td>
<td>1.164390</td>
<td>0.635929</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>DumPer</td>
<td>1.931207</td>
<td>0.745787</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>GROWTH</td>
<td>1.23791</td>
<td>0.265571</td>
<td>0.347522</td>
<td>2.294732</td>
</tr>
<tr>
<td>LEV</td>
<td>0.015977</td>
<td>0.012958</td>
<td>0.006578</td>
<td>0.042618</td>
</tr>
<tr>
<td>SIZE</td>
<td>11.25081</td>
<td>1.014803</td>
<td>9.245383</td>
<td>13.70164</td>
</tr>
</tbody>
</table>

*Source: 2011-2017 annual financial statement of banks, STATA 2015 Output*

From Table 4.1, the mean and standard deviation of return on equity is 13.9237% and 1.2294% respectively. This means that, on average, banks are getting more than 13.9237% returns on their equity. The mean and standard deviation of lending behaviour of banks is 0.215738 and 0.472911 respectively. The interpretation for the lending behaviour of banks is that, on average, banks commit close to twice of its deposits to loans. The mean and standard deviation of minimum capital requirement is 45.18137 and 11.04851 respectively.

The mean and standard deviation of the natural logarithm of total assets used to measure bank size was 11.25081 and 1.014803 respectively. The findings for the descriptive statistics show that the leverage ratio for banks was 1.5977% with a standard deviation of 1.2958%. The
minimum leverage ratio employed by a bank was 0.66578% while the maximum level of the leverage is 4.2618%. The mean and standard deviation of bank growth is 1.23791 and 0.265571 respectively. All variables have positive means ranging from 0.015 to 45.18137 over the examined period.

4.2 Pearson Correlation Analysis Results

The study used correlation analysis to measure the strength and direction of the relationship between the variables as test the presence of multicollinearity. Table 4.2 shows the results of the correlation analysis of CapReq, DumCap, DumPer, LEV, SIZE, GROWTH, and LB. Table 4.2 shows that all the correlation coefficients are less than 0.5, hence, the pairwise correlation shows that there is no multicollinearity. From Table 4.2, CapReq has a positive relationship with ROE of banks. This is because, the two variables were weakly positively correlated, $r = 0.15$. Also, DumCap has a positive relationship with ROE of banks. This is because, the two variables were weakly positively correlated, $r = 0.17$. Furthermore, DumPer has a positive relationship with ROE of banks. This is because, the two variables were weakly positively correlated, $r = 0.08$. Moreover, leverage has a negative relationship with ROE of banks. This is because, the two variables were weakly negatively correlated, $r = -0.23$. Bank size was identified to have a positive relationship with ROE of banks. This is because, the two variables were weakly positively correlated, $r = 0.11$. Bank growth was identified to have a positive relationship with ROE of banks. This is because, the two variables were weakly positively correlated, $r = 0.06$.

To assess the relationship between lending behavior and the other variables, CapReq has a negative relationship with lending behaviour of banks. This is because, the two variables were weakly positively correlated, $r = -0.07$. Also, DumCap has a negative relationship with lending behavior of banks. This is because, the two variables were weakly negatively correlated, $r = -$
Furthermore, DumPer has a negative relationship with lending behavior of banks. This is because, the two variables were weakly negatively correlated, \( r = -0.16 \). Moreover, leverage has a negative relationship with lending behavior of banks. This is because, the two variables were weakly negatively correlated, \( r = -0.07 \). Bank size was identified to have a positive relationship with lending behavior of banks. This is because, the two variables were weakly positively correlated, \( r = 0.13 \). Bank growth was identified to have a positive relationship with lending behavior of banks. This is because, the two variables were weakly positively correlated, \( r = 0.05 \).

**Table 4.2: Pearson Bivariate Correlation Coefficients**

<table>
<thead>
<tr>
<th></th>
<th>CapReq</th>
<th>DumCap</th>
<th>DumPer</th>
<th>SIZE</th>
<th>LEV</th>
<th>GROWTH</th>
<th>ROE</th>
<th>LB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CapReq</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DumCap</td>
<td>-0.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DumPer</td>
<td>0.13</td>
<td>0.07</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.90</td>
<td>-0.14</td>
<td>0.13</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>-0.26</td>
<td>-0.04</td>
<td>-0.08</td>
<td>-0.15</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROWTH</td>
<td>0.18</td>
<td>0.15</td>
<td>0.19</td>
<td>0.21</td>
<td>0.16</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>0.15</td>
<td>0.17</td>
<td>0.08</td>
<td>0.11</td>
<td>-0.23</td>
<td>0.06</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td>-0.07</td>
<td>-0.10</td>
<td>-0.16</td>
<td>0.13</td>
<td>-0.07</td>
<td>0.05</td>
<td>0.14</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: 20011-2017 annual financial statement of banks, EVIEW 2010 Output*

**4.3 Relationship between Capital Requirements and Profitability**

The relationship between capital requirement and return on equity is shown in Table 4.3. Before examining the relationship between capital requirement and return on equity, the study investigated the presence of multicollinearity, autocorrelation, heterogeneity, and outliers. The study used the Durbin-Watson (D-W) to check for the existence of autocorrelation, Variance
Inflation Factor (VIF) statistic to check for the existence of multicollinearity, and Bereush-Pagan heterogeneity statistic to check for the existence of heterogeneity. Both the fixed and random effect model is within the boundary of variance inflation factor showing that there is no multicollinearity. According to Gujarati & Sangeetha (2008), VIF’s of 10 or higher may be a reason for concern but from the study. The highest and lowest value of VIF statistics observed for fixed effect model was 1.639 and 1.244 respectively while the VIF statistic observed for random effect model was 1.713 and 1.284 respectively. The Durbin-Watson statistic was found to be 0.955414 in the fixed effect model and 0.927160 in the random effect model showing the presence of no autocorrelation.

Table 4.3 shows the results of the two panel data models, namely, fixed effects model and random effects model used to estimate the data. The post estimation diagnostics of the two models show that the conclusions are comparable even though the overall significance of the model and coefficient of variation are not significantly different. From instance, the fixed effects model had an adjusted R-squared of 0.74. This means that, the fixed effects model accounted for 74% variations in the dependent variable (profitability) which can be explained by the explanatory variable (capital requirements) controlling for bank size, bank growth, and leverage. Random effects models had an adjusted R-squared of 0.76. This means that the random effects model accounted for 76% variations in the dependent variable (profitability) which can be explained by the explanatory variable (capital requirements) controlling for bank size, bank growth, and leverage. However, the study employs the Hausman test statistics to distinguish between the two panel estimation models. From Table 4, the Hausman test statistic was 11.52 with p value less than 0.05 (p<0.05) showing that the null hypothesis that the random model is more appropriate is rejected. That is, the fixed effect model is preferred over the random effects.
model for the determination of variation in the profitability of banks in Ghana due to the minimum capital requirement. Hence, the study used the fixed effect regression model to analyze the data.

Table 4.3: Fixed Effects Model and Random Effects Model Results of Return of Equity

<table>
<thead>
<tr>
<th></th>
<th>Fixed Effects</th>
<th></th>
<th></th>
<th>Random Effects</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-test</td>
<td>P-value</td>
<td>VIF</td>
<td>Coeff.</td>
<td>t-test</td>
</tr>
<tr>
<td>CapReq</td>
<td>0.847</td>
<td>1.329</td>
<td>0.041***</td>
<td>1.368</td>
<td>0.780</td>
<td>1.217</td>
</tr>
<tr>
<td>DumCap</td>
<td>0.045</td>
<td>1.723</td>
<td>0.020***</td>
<td>1.516</td>
<td>0.061</td>
<td>1.694</td>
</tr>
<tr>
<td>DumPer</td>
<td>0.091</td>
<td>1.681</td>
<td>0.042***</td>
<td>1.244</td>
<td>0.085</td>
<td>1.462</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.057</td>
<td>1.824</td>
<td>0.001***</td>
<td>1.639</td>
<td>0.072</td>
<td>1.773</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.162</td>
<td>-2.166</td>
<td>0.061</td>
<td>1.352</td>
<td>-0.141</td>
<td>-2.396</td>
</tr>
<tr>
<td>GROWTH</td>
<td>0.274</td>
<td>1.510</td>
<td>0.053</td>
<td>1.290</td>
<td>0.225</td>
<td>1.637</td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>0.74</td>
<td></td>
<td></td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi2</td>
<td>12.19</td>
<td></td>
<td></td>
<td>11.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.002</td>
<td></td>
<td></td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-W</td>
<td>0.955414</td>
<td></td>
<td></td>
<td>0.927160</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hausman Test**

| Chisquare Statistic | 11.52 |

| P-value | 0.000 |

***p< 5%

*Source: 20011-2017 annual financial statement of banks, EVIEWS 2010 Output*
From the estimates of the fixed effects model, the coefficient of capital requirement has a statistically significant positive effect on the return on equity of banks in Ghana, \( \beta = 0.847 \), \( t(77) = 1.329, p < 0.05 \). This suggests that a 1 cedi increase in the capital requirement will increase the profitability of banks in Ghana by 0.847. This shows that banks’ capital requirement is a significant factor that increases profitability of banks in Ghana. This is consistent with studies by Sufian & Chong (2008) in Philippines and Aransiola (2013) in Nigeria who identified capital requirements or capitalization have a positive effect on profitability of banks. According to Ikpefan, Okorie, Agwu, & Achingamonu (2014), bank capitalization (capital requirement) has assisted to enhance the gross earnings of banks, deposits, loans and advances and shareholders fund. It has also enhanced equity investments which have also improved equity capitals and reserves. This finding agrees with signaling theory that higher capital creates the environment for bigger investment which generates bigger profits.

On the contrary, studies in Nigeria by Sani & Alani (2013) and in Spain by Trujillo-Ponce (2012) identified that capital requirement (capitalization) has a negative effect on profitability of banks.

Also, the coefficient of banks operating with the amount of capital stated for banks has a statistically significant positive effect on the return on equity of banks in Ghana, \( \beta = 0.045 \), \( t(77) = 1.723, p < 0.05 \). This suggests that an increase in banks’ ability to meet the required amount of capital stated for banks will increase the profitability of banks in Ghana by 0.045. This shows that a bank operating with the stated capital (Ghc 120 million) or more before the minimum capital requirement directive was issued in 2016 is a significant factor that increases
profitability of banks in Ghana. This is a sure guarantee of their ability to be key players in the global financial market.

Furthermore, the period for which the recapitalization was implemented has a significant positive influence on the profitability of banks in Ghana, $\beta = 0.091$, $t(77) = 1.681$, $p < 0.05$. That is a one year increase in period of banks to meet the statutory regulatory capital requirement, will increase the profitability of banks in Ghana by 0.091. This shows that the period that bank meet the statutory regulatory capital requirement is a significant factor that increases profitability of banks in Ghana. This is consistent with studies by Mohammed & Gani (2012) who identified a positive significant relationship between the period when regulatory capital was enforced on banks and profitability of banks.

Bank size has a positive significant relationship with return on equity, $\beta = 0.057$, $t(77) = 1.824$, $p < 0.05$. That is an increase in bank size will increase the profitability of banks in Ghana by 0.057. This is consistent with studies by Darkwah et al. (2016) who identified a positive significant relationship between bank size and profitability of banks in Ghana.

Leverage has a negative insignificant impact on return of equity and bank growth was identified to have a positive but insignificant impact on return of equity of banks in Ghana.

### 4.4 Relationship between Capital Requirement and Lending behaviour of Banks

The relationship between capital requirement and lending behaviour of banks is shown in Table 4.4. Before examining the relationship between capital requirements and lending behaviour of banks, the study investigated the presence of multicollinearity, autocorrelation, heterogeneity, and outliers. The study used the Durbin-Watson (D-W) to check for the existence of autocorrelation, Variance Inflation Factor (VIF) statistic to check for the existence of
multicollinearity, and Bereush-Pagan heterogeneity statistic to check for the existence of heterogeneity.

Both the fixed and random effect model is within the boundary of variance inflation factor showing that there is no multicollinearity. According to Gujarati and Sangeetha (2008), VIF’s of 10 or higher may be a reason for concern but from the study. The highest and lowest value of VIF statistics observed for fixed effect model was 1.710 and 1.163 respectively while the VIF statistic observed for random effect model was 1.698 and 1.194 respectively. The Durbin-Watson statistic was found to be 0.871062 in the fixed effect model and 0.900148 in the random effect model showing the presence of no autocorrelation.

Table 4.4 shows the results of the two panel data models, namely, fixed effects model and random effects model used to estimate the data. The post estimation diagnostics of the two models show that the conclusions are comparable even though the overall significance of the model and coefficient of variation are not significantly different. From instance, the fixed effects model had an adjusted R-squared of 0.81. This means that, the fixed effects model accounted for 81% variations in the dependent variable (lending behaviour) which can be explained by the explanatory variable (capital requirements) controlling for bank size, bank growth, and leverage. Random effects models had an adjusted R-squared of 0.79. This means that the random effects model accounted for 79% variations in the dependent variable (lending behaviour) which can be explained by the explanatory variable (capital requirements) controlling for bank size, bank growth, and leverage. However, the study employs the Hausman test statistics to distinguish between the two panel estimation models. From Table 4, the Hausman test statistic was 13.74 with p value less than 0.05 (p<0.05) showing that the null hypothesis that the random model is more appropriate is rejected. That is, the fixed effect model is preferred over the random effects
model for the determination of variation in the lending behavior of banks in Ghana due to the minimum capital requirement. Hence, the study used the fixed effect regression model to analyze the data.

Table 4.4: Fixed Effects Model and Random Effects Model Results of Lending Behaviour of Banks

<table>
<thead>
<tr>
<th></th>
<th>Fixed Effects</th>
<th>Random Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-test</td>
</tr>
<tr>
<td>CapReq</td>
<td>-0.613</td>
<td>-1.202</td>
</tr>
<tr>
<td>DumCap</td>
<td>-0.152</td>
<td>-1.936</td>
</tr>
<tr>
<td>DumPer</td>
<td>-0.188</td>
<td>-1.413</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.209</td>
<td>1.392</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.371</td>
<td>-2.426</td>
</tr>
<tr>
<td>GROWTH</td>
<td>0.265</td>
<td>1.374</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>Chi2</td>
<td>14.36</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>D-W</td>
<td>0.871062</td>
<td></td>
</tr>
</tbody>
</table>

**Hausman Test**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Chisquare</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13.74</td>
</tr>
</tbody>
</table>

***p< 5%

*Source: 20011-2017 annual financial statement of banks, EVIEWS 2010 Output*
From the estimates of the fixed effects model, the coefficient of capital requirement has a statistically significant negative effect on the lending behaviour of banks in Ghana, $\beta = -0.613$, $t(77) = -1.202, p < 0.05$. This suggests that a 1 cedi increase in the capital requirement will reduce the lending behaviour of banks in Ghana by 0.613. This shows that the capital requirement of banks is a significant factor that reduces the lending behaviour of banks in Ghana. This is consistent with studies by Adegbaju & Olokoyo (2008) who found that minimum capital requirement reduces the lending behavior of banks. Adegbaju & Olokoyo (2008) stated that a strong capital is needed to absorb the losses emanating from non-performing loans. Generally, an increase in the capital requirement of banks reduces their lending behaviour and thereby causing a decrease in economic growth.

Also, the coefficient of banks operating with the amount of capital stated for banks has a statistically significant negative effect on the lending behavior of banks in Ghana, $\beta = -0.152$, $t(77) = -1.936, p < 0.05$. This suggests that an increase in banks’ ability to meet the required amount of capital stated for banks will decrease the lending behaviour of banks in Ghana by 0.152. This shows that a bank operating with the stated capital (Ghc 120 million) or more before the minimum capital requirement directive was issued in 2016 is a significant factor that decreases the lending behaviour of banks in Ghana.

Furthermore, the period for which the minimum capital requirement was implemented has a significant negative influence on the lending behaviour of banks in Ghana, $\beta = -0.188$, $t(77) = -1.413, p < 0.05$. That is a one year increase in period of banks to meet the statutory regulatory capital requirement, will decrease the lending behaviour of banks in Ghana by 0.188.
This shows that the period that bank meet the statutory regulatory capital requirement is a significant factor that decreases the lending behaviour of banks in Ghana.

Bank size has a positive significant relationship with lending behavior of banks, $\beta = 0.209$, $t(77) = 1.392, p < 0.05$. That is an increase in bank size will increase the lending behavior of banks in Ghana by 0.209.

Leverage has a negative significant relationship with lending behavior of banks, $\beta = -0.371$, $t(77) = -2.426, p < 0.05$. That is an increase in leverage will decrease the lending behavior of banks in Ghana by 0.371. Bank growth was identified to have a negative but insignificant impact on the lending behaviour of banks in Ghana.

4.5 Chapter Summary

This chapter has presented the descriptive statistics of the variables used in the study, results of Pearson correlation analysis and results of pooled regression analysis when assessing the impact of working capital management on profitability of Ghanaian banks.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction
This chapter shows a summary of the findings from the study, conclusions drawn from those findings and recommendations. It also provided some directions for further study with possible areas for future research.

5.1 Summary
The purpose of the study which was to examine the effect of the minimum regulatory capital requirements on the profitability and lending behaviour of banks in Ghana, calls for a conclusion and responsible recommendations to enhance the banking sector’s responsibility of meeting the minimum capital requirement to enhance profits. Several action plans by banks to generate more profits are on the increase. As an example, one could refer to the introduction and strict enforcement of the banking Law 1989 (PNDCL 225) when the first capital requirement was set at a minimum to paid up capital equivalent to about $740,700. This increased to Ghc7 million in 2003, Ghc 60 million in 2008, and 120 million in 2013. This enabled banks who meet this requirement to operate freely and invest to generate more profit, be more resilient to handle unforeseen loses.

Major Findings
- The mean and standard deviation of return on equity was found to be 13.9237% and 1.2294% respectively. This means that, on average, banks are getting more than 13.9237% returns on their equity.
• The mean and standard deviation of lending behaviour of banks was found to be 0.215738 and 0.472911 respectively. This means that, on average, banks commit close to twice of its deposits to loans.

• The mean and standard deviation of minimum capital requirement is 45.18137 and 11.04851 respectively.

• The fixed effect model was preferred over the random effects model for the determination of variation in the profitability of banks in Ghana due to the minimum capital requirement using the Hausman Test.

• The fixed effect model is preferred over the random effects model for the determination of variation in the lending behavior of banks in Ghana due to the minimum capital requirement using the Hausman Test.

• The study found a positive effect of capital requirement on the profitability of banks in Ghana. This means that capital requirement enhances equity investments which have also improved equity capitals and reserves.

• The study found a negative effect of capital requirement on the lending behavior of banks in Ghana. This means that an increase in the capital requirement of banks reduces their lending behaviour and thereby causing a decrease in economic growth.

5.2 Conclusions

Certainly, considering the major findings of the study, the conclusions are that, capital requirement positively affects the profitability of banks in Ghana. This means that, despite the entry of new banks into the banking industry, the mergers and acquisitions that happened, and the significant fundraising by banks form the Ghana Stock Exchange through the issuing of IPOs within the period under study till date, banks still had enough capital to handle adverse
macroeconomic shocks. The study also concludes that, the availability of the required regulatory capital even before the recapitalization exercise in 2013 has assisted the banking industry to increase their capital. Furthermore, the study concludes that capital requirement has an inverse influence on the lending behaviour of banks.

5.3 Recommendations

The research has revealed a clear understanding of the effect of capital requirement on profitability and lending behaviours of banks in Ghana. Therefore, the recommendations of the study based on the findings and conclusions are as follows: bank managers should intensify their effort of enhancing the banks’ profitability by ensuring that there is enough capital to prevent liquidation. Banks should put in some policies and systems to manage their lending behaviours. Banks managers should separate honest customers facing short term loan payment problems from habitual defaulters. Otherwise Ghanaian banks may lose their loyal customers. Bank of Ghana should continue to enhance their supervisory role. This is because, with good regulation and bank supervision, banks will minimize unnecessary cost and expenses and therefore, increase their profits. Furthermore, good corporate governance should be established by the banks to permit transparency and reduce bank fraud.

Suggestions for Future Research

Future research should extend the period of study and assess the performance of banks during the various recapitalization periods. Also, the scope of further research may be extended to include all the banks as well as assess the effect of capital requirement on the profitability of other financial institutions such as insurance companies and micro financial institutions.
References


