UNIVERSITY OF GHANA, LEGON

THE IMPACT OF ENERGY SECTOR DEBT ON BANKS' TOTAL LIABILITIES TO TOTAL ASSET RATIO IN GHANA

PRISCILLA ASABEA ASARE

(10369705)

A LONG ESSAY SUBMITTED TO THE DEPARTMENT OF FINANCE, UNIVERSITY OF GHANA, GRADUATE BUSINESS SCHOOL, IN PARTIAL FULFILMENT FOR THE AWARD OF MSc. IN DEVELOPMENT FINANCE

JULY, 2019

DECLARATION

I, Priscilla Asabea Asare, hereby earnestly declare that this research work submitted is the outcome of my own research under the guidance of Dr. Amin Karimu. In addition, all the results obtained does not include results or findings published in any other educational institution. All references used in the work have been duly acknowledged.

……. …….

PRISCILLA ASABEA ASARE **DATE:**

(10369705)

CERTIFICATION

I hereby certify that the preparation and presentation of this long essay was supervised in accordance with the guidelines on supervision of research work laid down by the University of Ghana, Legon.

……. ……..

DR. AMINU KARIMU **DATE:**

DEDICATION

To my family and everyone who in one way or the other contributed to the successful completion of this study.

ACKNOWLEDGEMENT

My first gratitude is to God for providing me with such an opportunity to undertake this program. Also, I would like to thank Dr. Amin Karimu for his guidance and commitment. I am really grateful acknowledged for his patience.

Finally, I would like to acknowledge my family and friends, especially Mr. Khalid Odartey Lamptey for his immense support throughout my study. God richly bless you all.

ABSTRACT

The energy sector has experienced tremendous growth in the past year in line with rapid population growth in the country. The increase in demand sometimes leads to the inability of the State Owned Enterprises (SOEs) to meet the user's needs and therefore increases its operational cost. They, therefore, borrow from both internal and external sources to finance its operations. Unfortunately, there are less empirical studies that show the impact of energy sector debts on the balance sheet of commercial banks. This study sought to address these challenges by examining if borrowings from these energy sector SOEs contribute significantly to the challenges being faced by the banks. In addition, the study investigates the factors that increase the liability ratio of banks and the relationship between energy sector loans from commercial banks and the liability ratio of the banks. The researcher used secondary data from annual financial reports of twelve (12) commercial banks. The study also gathered energy sector borrowings from the SOEs using their annual reports. The paper used Panel Data Regression analysis to determine the impact of energy sector debt on banks' liability ratio and other factors that affected it. The major findings attained from the regression analysis indicate that energy sector loans do not have any significant effect on solvency ratio whereas the capital adequacy ratio had a positive effect on the solvency ratio of banks. Moreover, the empirical analysis further suggest that the size of banks was found to substantially affect the solvency ratio positively despite the fact that non-performing loans were found not to significantly affect the solvency rati

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

BOST	-	Bulk Oil Storage and Transportation
CAR	-	Capital Adequacy Ratio
CBG	-	Consolidated Bank Ghana
ECG	-	Electricity Company of Ghana
EMCAA	-	Economic Community and Monetary Union of Central Africa
ESL	-	Energy Sector Loans
ESLA	-	Energy Sector Levy Act
GNGC	-	Ghana National Gas Company Limited
GNPC	-	Ghana National Petroleum Corporation
GRA	-	Ghana Revenue Authority
GRIDCo	-	Ghana Grid Company
GT Bank	-	Guaranty Trust Bank
NPA	-	National Petroleum Authority
NPL	-	Non-Performing Loan
PDS	-	Power Distribution Services
SOE	-	Sector State-Owned
UBA	-	United Bank for Africa
UMB	-	Universal Merchant Bank
VRA	-	Volta River Authority

CHAPTER ONE

INTRODUCTION

1.1 Background

Banks are the largest financial intermediaries in developing countries for both the private sector and government. They dominate the financial sector in developing countries, accounting for a large proportion of total assets. The functions of banks in economic development cannot be understated. The functions include borrowing and lending from surplus to deficit institutions, settlements, payment of debts, transfer of funds, forex transactions, savings, and investment bill finance.

To implement these services, banks enforce the functions of deposit acceptance, attracting funds from individuals and businesses, investment, granting loan requests, and the ability to transfer funds among account holders. Therefore, these financial institutions channel funds into profit to guarantee that surpluses are used efficiently to create jobs, encourage economic benefits and equip depositors with secured income.

Governments of developing countries often borrow to finance public investment projects. One important argument supporting borrowing by government from commercial banks is the equitable burden of cost to reduce the burden of cost on taxpayers.

In addition to financing public investment projects, the government in developing countries also borrow to pay back arrears in some cases. In Ghana, debt levels of Ghana's Energy Sector State-Owned Enterprises (SOEs) have seen a significant increase over the years. The energy sector SOEs comprise: Power Distribution Services Ghana Limited (PDS) formerly Electricity Company of Ghana (ECG), Volta River Authority (VRA), Ghana Grid Company (GRIDCo), Bui Power Authority, Ghana National Petroleum Corporation (GNPC), Bulk Oil Storage and

Transportation (BOST) and the Ghana National Gas Company Limited (GNGC). The non-performing loans (NPL) ratio of the banking sector grew between June 2016 and June 2017, mainly due to an increase in energy and other large non-oil related default in payment to banks. NPL in the banking industry increased from GH¢6.09 billion to GH¢7.96 billion during that period (BoG, 2017). These NPLs are, by extension, sovereign debts since the institutions involved are completely owned by the government. According to Popov and Van Horen, (2013), losses on sovereign debt can have a significant adverse impact on the profitability of the bank and asset side of the bank's balance sheet.

1.2 Problem Statement

Domestic debt may lead to financial development as determined by Kutivadze (2011). Although banks are better capitalized in oil dependent economies, their credit to the private sector is relatively low resulting in the crowding out effect by the government (Anyanwu, Gan, & Hu, 2018).

A large percentage of the energy sector debt owed to banks in Ghana has adversely affected the balance sheet of the banks, leading to the continuous rise of banks' nonperforming loans. Unfortunately, there are less empirical studies on the impact of energy sector debts on the balance sheet of commercial banks. The ensuing result is the disruption in real activity, especially in countries in which better institutions allow banks to be more leveraged as in the case of Ghana. Public debt may harm financial development in economies where government credit account for a significant share of bank lending.

1.3 Research Purpose

Domestic debts may lead to economic growth in the short run, but can impede the growth in the long run if the debt service repayment regime exceeds the ability to pay with some probability. It will lead to debt overhang and at a point, the interest will become higher than the principal. At this point, crowding out of investment and private sector constraints will arise due to capital shortages, having an adverse effect on the bank's balance sheet. The research purpose is to examine the relationship between energy sector loans from commercial banks and the liability ratio of the banks.

1.4 Objectives of the Study

The study seeks to examine the impact of energy sector loans on the liability ratio of banks. The objectives are:

1. To determine the relationship between energy sector loans and solvency ratio of banks: and
2. To determine the factors that increases the solvency ratio of banks.

1.5 Research Questions

The research will answer the following questions:

1. What is the relationship between energy sector loans and liability ratio of banks?
2. What are the factors that increase the liability ratio of banks?

1.6 Significance of the Study

By examining energy sector loans from the banks, the findings will help inform policymakers of the total energy sector debts owed to domestic banks and provide recommendations for policy

formulation to address the phenomenon. The study intends to contribute to empirical literature since limited research has been done in this area of study.

1.7 Methodology

The research objectives will be met by using data from the commercial banks' annual financial reports from the year 2013 to 2017. The chosen timeframe is because of the availability of banks financial reports for that period. The banks include Ecobank Ghana, Standard Chartered Bank, Consolidated Bank Ghana (CBG), Zenith Bank, Fidelity Bank, Guaranty Trust (GT) Bank, United Bank for Africa (UBA), Stanbic Bank, Universal Merchant Bank (UMB), CAL Bank, Access Bank, and First Atlantic Bank.

An econometric approach will be used to assess the liability ratio of the banks. The data analysis will be done in three main three of econometric research outlined by Koutsoyiannis (1977); that is, model specification, model estimation, and evaluation of the estimates.

A dynamic panel model will be used to determine the effect of the energy sector debts on the banks. The use of panel modelling will help to identify common properties while taking into consideration the differences between individual components. Panel data modelling also improves the degrees of freedom.

1.8 Limitations of the Study

The research does not provide a complete picture of these assessments. We will not examine the balance sheet of banks that have not lent to the government. The study is limited to commercial banks which the government has borrowed from only. Furthermore, some have argued that the balance sheet does not take into consideration the long-term position and the overall true performance of the bank.

The research may have certain constraints because of time limitations. The limitations include:

- Limitation of using secondary data may influence the results since the research is based on secondary data
- The secondary data drawn from banks annual reports for the five years may be a limited period of time which does not effectively reveal the actual changes in the liability ratios of the bank.

1.9 Chapter Outline

The entire study will be in five main chapters. Chapter one of the study will contain the introduction of the research. It will present the background study, problem statement, research objectives and questions, the significance of the study and its limitations. Chapter two will consist of the theoretical and empirical literature review. Chapter three will provide the methodology of the study. Chapter four will present the data analysis. Chapter five will discuss the summary, major findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews of theoretical underpinnings and relevant empirical literature for the subject under study. It evaluates the body of theoretical knowledge on the issue and various empirical reviews on the study, with the aim of achieving the research objectives.

2.2 Theoretical Literature

2.2.1 Banks Performance Measurement

Proper performance measurement is a central part of the banking sector, as this can affect the overall performance, efficiency and profit of a banking system. Increased assessment of financial performance will lead to improvement in the organisation's functions and processes (Nimalathasan, 2008).

Financial performance and its measurement are well researched in the areas of finance and management (Nimalathasan, 2008). Gibson and Cassar (2005) state that a there is a need for a range of performance indicators to show the various aspects of the bank performance. The concept of effective banking is often built around these indicators. One of the methods used to evaluate the banking sector's financial soundness is by measuring the liability ratio of the bank using its balance sheet.

2.2.2 Assets

Asset quality is one of the key performance indicators of bank performance. It is assessed by the ratio of NPL, the provision ratio, and the charge for bad debts to net loans

(Sebe-Yeboah, & Mensah, 2014). Asset quality is an essential component that determines the bank's capacity and is linked directly to capital adequacy, because the solvency risks of a bank are often determined by its assets depreciation (IMF and World Bank, 2005, p. 26).

Bank efficiency studies have examined the quality of assets in recent times, specifically NPLs. Not including this variable could result in an incorrect measure of bank performance (Mester, 1996).

The quality of the assets in the banking sector is particularly determined by the loans quality as this classification of assets constitutes a significant proportion of a bank's balance sheet. Usually, the quality of bank loans is measured using the ratio of NPLs to total loans. This shows the share of NPLs in a bank's total loans. Another important indicator in assessing asset quality is the proportion of total loans to the total assets. Loans often constitute the most significant portion of a bank's assets; however, a high ratio represents an assets structure that is more susceptible to losses from loan (Atikoğullari, 2009, p. 216).

2.2.3 Loan Quality

Loans and advances provide a large share of the bank's income and its quality is therefore crucial to the bank's profitability and survival. Loan quality has often been measured by either NPLs to total loans or NPLs to total assets (Avkiran & Cai, 2012). For most financial institutions, loans are considered to be the riskiest assets, and findings on asset quality show that credit loss provision between strong and problem banks varies significantly (Sinkey, 1975).

Curry, Elmer, & Fissel, (2003) suggests that credit quality can be measured using the ratio of loan loss reserves or provisions to total assets. According to King, Nuxoll, & Yeager (2006), the loan loss reserves ratio to total loans for failed banks is higher than successful banks.

2.2.4 Non-Performing Loans

Non-performing loans affect the cost efficiency of banks, according to Karim, Chan, & Hassan (2010). They argue that this will have an adverse effect as such banks will require increased efforts to reduce their NPLs. They outline some of the extra operating costs as costs incurred from additional monitoring of the defaulting borrowers, collateral seizure, maintenance, and eventually disposal if default later occurs, evaluating and negotiating possible arrangement with borrowers, and the distraction of the management from solving other important operational problems. Even the majority of cost-effective banks need to acquire additional resources to manage problem loans. Non-performing loans in the banking sector therefore lead to inefficiency as supported by findings from Altunbas, Liu, Molyneux, & Seth (2000); Fan and Shaffer (2004); and Girardone, Molyneux, Gardener, (2004). This is a result of better credit risk management by efficient banks as implied by Berger and DeYoung (1997). This is especially true as a large percentage of non-performing loans may indicate that banks are using fewer funds than usual in their loan assessment process.

It can therefore be determined if an increase in problem loans would adversely affect the efficiency of bank by establishing the relationship between NPLs and bank performance.

2.2.5 Solvency Ratio

Unless remedied, illiquidity of banks give rise to in insolvency leading to bankruptcy of the bank, as its assets will be far less than its liabilities (Cooper et al 1998). The solvency of an institution represents its ability to cover its liabilities and also influence its financial state. The total liabilities to assets ratio is used to determine the solvency ratios indicating the bank's further capacity to borrow. Therefore, analysis of solvency provides the basis for assessing a bank's financial state. According to Subačienė and Villis (2010), the ratio of total liabilities to

total assets is considered the main long-term solvency ratio which indicates the share of borrowed funds that used to increase the bank's asset.

The total liability to total assets ratio analysis gives an indication on what influences the bank's solvency. It provides an objective analysis of the bank's borrowing trend. The ratio can be negative, indicating potential solvency issues. Banks showing signs of financial distress will often have a high liability to assets ratio.

2.2.6 Energy Sector Debt

Some of the main causes of debt in energy sector include poor financial performance from low productivity, high debt levels, consumer default of electricity bills settlement, high fixed costs as a result of power generation, and low productivity of labour and capital in the energy sector.

The industry's non-performing loans are expected to decline following the restructuring of energy-sector SOEs debts. Excessive debt exposes the institution to potential large interest costs and the risk bankruptcy. It is important for a bank's assets to exceed its liabilities indicating a robust system. A study by the World Bank group (2017) to determine which emerging markets and developing economies faced vulnerabilities in their corporate balance sheet found that, energy-related institutions showed an increase in financial vulnerabilities along with the decrease in oil prices, especially since 2014.

According to data from the Bank of Ghana, the stock of NPLs of banks in Ghana as at June 30, 2017 was GH¢7.96 billion. The three major power utilities, PDS, VRA, and GRIDCo total outstanding loans to banks at the end of 2015 was GH¢ 7.7 billion.

The outlook for the banking industry remains positive, particularly after the banks have been successfully restructured to decrease loans incurred by energy-related SOEs. As the

repayment continues and the banks' debt structure is reclassified, it is expected that the NPL ratios in the banking industry will further improve. With the onset of payments to reduce energy sector related SOE debts, the NPL ratio associated to the public sector reduced from 3.9 percent to 3.2 percent from December 2015 to December 2016. However, asset quality declined within the year, although the last quarter of 2016 indicated some improvement of the energy-related state institutions debts owed banks after the restructuring and onset of repayment. The stock of NPLs increased from GH¢4.4 billion to GH¢6.2 billion from December 2015 to December 2016. The NPL ratio for the banking sector also increased from 14.7 percent in December 2015 to 17.3 percent in December 2016.

2.2.7 Energy Sector Levy Act (ESLA)

ESLA is a Special Purpose Vehicle (SPV) in Ghana which is responsible for issuing long-term bonds to solve debts in the energy sector owed to banks and trade creditors. The levies are derived from the sale of petrol, residual fuel oil, diesel, marine gas oil, liquefied petroleum gas, electricity, and kerosene. The institutions responsible for the levy collection are the Ghana Revenue Authority (GRA), Power Distribution Service, National Petroleum Authority (NPA), Northern Electricity Distribution Company (NEDCO) and the VRA.

Ghana's energy sector was faced with some challenges before the introduction of the ESLA. This hindered effective implementation of projects although the sector held a lot of promise for the country's economic transformation. The sector struggled to effectively manage their major liabilities before the introduction of the levies. These liabilities increased their exposure to credit and liquidity risk, and therefore, significantly affected the balance sheets of their counterpart creditor banks negatively. In October 2017, the government of Ghana supported the ESLA PLC to issue a cedi-denominated medium to long-term amortization bond based on Energy Debt

Recovery Levy receivables to refinance existing debts owed by utility companies to banks and trade creditors.

2.3 Empirical Literature Review

With limited research done on state-owned enterprises and banks performance in developing countries, this section presents relevant background knowledge the topic. Also, the relationship between bank performance and domestic debt is discussed coupled with the models and panel data techniques adopted in earlier works.

2.3.1 Non-Performing Loans Ratio and Bank Performance

A research was undertaken by Araka, Mogwambo, & Otieno (2018) to analyze the factors that affected the performance of selected banks in Kenya. The study used data from questionnaires and Bank's Annual Reports from 2013 to 2017. The research concluded that NPLs had a strong effect the financial performance of selected banks.

Bernstein (2014) conducted a study to determine the relationship between asset quality and scale economies in banking. A regression analysis was used with NPLs as the regressor and operational costs as the dependent variable. The empirical findings indicated that an important determining factor of the bank cost is the amount of NPLs.

2.3.2 Bank Size and Bank Performance

Odundo & Orwaru (2018) analyzed the effect of bank size on financial stability of banks in Kenya. The research used secondary balanced panel data from the annual reports of ten (10) commercial banks. The research used the natural logarithm of banks total assets as a proxy of bank size. The results showed that, bank size has a significant negative effect on financial

stability, implying that banks that are larger in size are less stable as compared to the small banks.

Nouaili, Abaoub, & Ochisize (2015) explored the determinants of banking performance using trade banks in Tunisia as a case study. The empirical results concluded that bank size, measured as log of bank total asset, acts negatively on banks performance using panel data random effect. Furthermore, the research findings stated that large scale banks did not benefit from economies of scale. They could rather face diseconomies of scale.

2.3.3 Capital Adequacy Ratio (CAR) and Bank Performance

A recent study by Lotto (2018) concentrated on analyzing the impact capital regulations of banks on operating efficiency in Tanzania. The research used data from selected banks between the year 2009 and 2015. Conclusions indicate a strong positive effect of capital ratio on the effectiveness of banking operations indicating that, capital adequacy strengthens financial stability in the form of a larger capital support and decrease moral hazard between investors and debt holders by improving bank operating efficiency. Findings also revealed that capital adequacy is an important way to prevent bank solvency and increase profitability.

The study by Horváth, Seidler, & Weill (2014) which analyzed the correlation between Bank Capital and Liquidity Creation performed Granger-causality tests in a dynamic Generalized Methods of Moments (GMM) panel estimator framework on data from banks in Czech Republic from the period of 2000 to 2010. The model suggested that higher capitalization would improve safety and provide higher liquidity for banks. In addition, a larger liquidity creation could also lead to bank solvency (Horváth et al., 2014).

Barnor and Odonkor (2012) examined how capital adequacy affected banks performance in Ghana. The research used a panel data analysis on data acquired from financial statements of twenty-one commercial banks from 2000 to 2010. The research found that, as additional capital is reserved to increase the safety of banks, bank performance is affected. According to the study, the continuous review of the capital base is to continuously ensure stability, and increase confidence in the banking sector.

2.3.4 Domestic Debt and Bank Performance

Altaylıgil & Akkay (2013) analyzed how domestic debt would affect financial development in Turkey between the 2002 and 2012. The study used time series analysis in which the results showed an increase in domestic debt will impede financial development.

Ondo (2017) researched on Public Debt and Financial Stability of the Economic Community and Monetary Union of Central Africa (EMCCA). The article analyzed the relationship between the variables using nonlinear regime change panel for the period of 1993-2015. The research concluded that public debt could adversely affect financial stability in the EMCCA.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter discusses various underlying philosophies, approach and processes employed in generating the research objectives. It shows the research approach, strategy, and method used to arrive at the research objectives. It outlines the data used, source of data, and the justification for variables used. An econometric model is designed to analyze the dependent and independent variables.

3.1 Research philosophy

The manner or method of a research depends on the kind of underlying philosophy employed. The choice of which research approach to employ and the reason behind the choice are determined by the philosophical approach adopted. Research philosophy determines which research strategy, approach and methodology would be employed in undertaking the research.

The research philosophy employed for this work is the epistemological research philosophy which is a research philosophy that hinges on acceptable and justified knowledge for a particular area. It examines the scope, validity and methods of acquiring knowledge. This research philosophy involves positivism and interpretivism and realism research approach.

3.2 Research Approach

Considering the research approaches that exist for this work, the positivism, interpretivism or realism could be adopted. A positivism approach is an approach based on data collection and analysis. It makes use of quantifiable observation and uses a structured methodology that does not give enough room for manipulation of data by the researcher. Apositivist research approach

is an approach that controls the use of factual data from either already existing data or from valid factual related data of a study. Unlike the Positivist research approach, the interpretivism approach which is based on the view that social constructions such as languages are the access to reality (Myers, 2008). This approach emphasizes the consideration of the differences between individuals or among people. It focuses on meanings based on several methods to expose various views about a study. The positivism research approach was employed for the study consistent with the objectives and kind of data used for the study.

3.3 Research Strategy

The study strategy is approached on the basis of data collection and hypothesis development. With the epistemological research philosophy, two main research strategies that could be employed are the inductive and deductive approaches whose appropriateness for any study depends on the research context of a study (Huffcut, 2010). The deductive approach looks at research being guided by existing theories. The theory serves as the theoretical background from which the research is undertaken. This is the strategy employed for this study. This approach has the advantage of ensuring the generation of successful research outcomes with maximum certainty.

3.4 Research Method

To obtain valid and quality research results, there is a need to ensure that appropriate data collection methods are employed. The method of data collection could be qualitative, quantitative or mixed-method in line with Creswell's (2009) study. This study employs a quantitative method in its data collection. Quantitative research method ensures that quantifiable data from a restricted data collection environment is used. It leads to obtaining only quantifiable research data and results. On the other hand, the qualitative research approach leads to the

collection of more detailed data due to an unrestricted data collection environment but could lead to data that is more difficult to measure. In line with this, quantitative data would be employed for this study.

3.5 Population and Sample

The total number of banks licensed by the Bank of Ghana, excluding rural banks, as at January 2019 is 27. They form the population size of the study. Out of these, twelve banks were selected forming a total of 44.4% of the population. This percentage is considered large enough to provide a much more reliable view of the entire population and could serve as a good basis for more reliable conclusions about the population. Purposive sampling technique would be employed in selecting the twelve banks. The basis for the selection of the sample is based on the availability of data. The sample period for the analysis spans from 2013 to 2017.

3.6 Data collection and Source

Secondary data obtained from the annual financial reports of the commercial banks from 2013 to 2017 will be used for the study. The banks to be used for this purpose include Stanbic Bank, Ecobank Ghana, Standard Chartered Bank, CAL Bank, CBG, Zenith Bank, GT Bank, UBA, UMB, Access Bank, Fidelity Bank, and First Atlantic Bank. The data to be collected include total liability, total asset, energy sector loans, capital adequacy ratio, size of the banks and non-performing loans.

3.7 Specification of Econometric Models

The study would use panel data regression techniques to determine the relationships between the various variables employed. As outlined by Gujarati (2004), panel data gives provides more information, degrees of freedom and efficiency, variability, and less collinearity among

variables. This is achieved by combining both time series and cross-section data findings. Given the nature of the analysis to be conducted, a Hausman test will be performed to determine whether the fixed effect or random effect will be used for the data analysis.

The general fixed effect model is of the form:

$$Y_{it} = \alpha_i + \beta_i X_{it} + \varepsilon_{it} \quad \text{.....(1)}$$

The general random effect model is of the form:

$$Y_{it} = \alpha + \beta_i X_{it} + \varepsilon_{it} \quad \text{.....(2)}$$

where i indicates the cross-section dimension, t shows the time dimension, X_{it} is a vector of explanatory variables for bank i in time t, α is a constant, β are coefficients which represents the slope of variables, and ε_i is the error term.

Based on the general model, the study would employ the model:

$$L/A\ Ratio_{it} = \alpha + \beta_1 ESL_{it} + \beta_2 CAR_{it} + \beta_3 Size_{it} + \beta_4 NPL_{it} + \varepsilon_{it} \quad \text{.....(3)}$$

Comprising of one dependent variable and four independent variables of which energy sector debts is the main focus in the study. Where

L/A Ratio = Total Liability to Total Asset Ratio

ESL = Energy Sector Loans

CAR = Capital Adequacy Ratio

Size = Size of Banks (calculated by natural log of total assets)

NPL = Non-Performing Loans

α= the constant

$\mathcal{E}_t$ = Within-entity error at time (t) respectively.

The use of panel modelling will help to identify a common set of characteristics while still considering the heterogeneity present between individual units. Modelling panel data also enhances the degrees of freedom.

3.8 Explanation of Variables

The variables employed in the analysis have various reasons for their inclusion. In spite of the fact that there could be a number of other variables, not all the variables that has some effects on the dependent variable were considered in the model. These other factors exclusion could be catered by means of the error term.

3.8.1 Dependent Variables

Total Liabilities to Assets ratio is used as a measure of bank solvency throughout the literature reviewed in this study. The Total Liabilities ratio is calculated as:

$$\text{Liability to Asset Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

It is used to determine the long-term solvency ratios indicative of an institution's total level of liabilities and its further capacity to borrow. A positive ratio signifies that the bank's debt is reducing and it is becoming more stable. The ratio should presumably not be higher than 70 percent (Mackevičius, 2009).

3.8.2 Explanatory Variables

a. Bank Size

One of the most frequently used measures of a bank's size is its total assets (Marinković and Radović, 2014). The size of banks depicts the economies and diseconomies of scale of the bank. In the research, the natural log of banks' total assets will be used as a measure of bank size. Sufian & Habibullah (2009); Adusei (2015), and Demirguc-Kunt & Huizinga (2012) are some of the researchers that use the logarithm of banks' total assets as its size.

b. Capital Adequacy Ratio

Capital adequacy ratio is used by banks to measure their financial strength. It is computed by dividing the bank's capital by its risk-weighted assets. CAR is a measure of safety for banking institutions since it gives an indication of how losses could be absorbed. In this regard, capital adequacy ratios are usually put in place to ensure the efficiency and stability of financial systems by decreasing the possibility of insolvency. A higher the ratio implies that, the capital of the bank is higher than its risk and hence, the greater the safety it provides.

$$CAR = \frac{\text{Total Capital}}{\text{Total Risk}-\text{Weighted Asset}}$$

c. Non-Performing Loans Ratio

As banks provide loans to individuals and institutions, there is the need to measure how much of such offers do not give the banks the profits they intend to obtain. Non-performing loans measure how much unyielding profit loans have amounted to or the total volume of loans that have gone as bad debts. The NPL ratio could therefore be used a good indicator of a bank performance. The NPL calculation in Ghana is by finding the percentage of gross non-performing loans divided by total credit.

d. Energy Sector Loans

Energy Sector institutions borrow from both external and internal sources from banks. Banks provide a major proportion of their domestic loans. Borrowings of the SOEs from the banks are used as the energy sector loans.

3.9 Data Analysis

After data is collected, there is the need to put them together and investigate to find how suitable, adequately and reliable it is for providing results for achieving the research objectives. Data analysis is one of the processes of generating useful information from collected data. In analyzing data, it could be done qualitatively or quantitatively. Based on the kind of data being used, quantitative data analysis would be employed for the study. In data analysis, it should be ensured that the collected data are analyzed.

The data would be analyzed by the use of STATA software tool. The objective would be attained by means of descriptive statistics and regression models. Inferential statistics would be used to establish the relationship between total liabilities to total asset ratio and the various dependent variables, especially energy sector loans, by means of panel regression.

3.10 Ethical Issues

Ethical issues in research increase the credibility of the method used and the findings of the research. Data used for the study are from secondary sources which imply that no respondents were used for the study. For this reason, a number of ethical issues would be considered. In the first place, efforts to ensure that the study did not involve plagiarism are key to prevent the usage of academic materials and scholarly works without acknowledging

the sources or using someone else's information to draw conclusions about this study. Again, the objectiveness of the researcher in the interpretation of data results is also considered. This is such that individual biases are not included in the outcome of the results and its interpretation. This is to ensure that the outcomes and results are credible to policymakers and future researchers.

A number of challenges were anticipated. However, steps would be taken to mitigate such challenges. This would be done by adhering to proposed objectives, ensuing discipline and commitment and making time to plan and write the dissertation. It is expected that this would be help in controlling the challenges in undertaking this study.

CHAPTER FOUR

DATA ANALYSIS

4.0 Introduction

This chapter provides information on the data analysis and results from the data collected from secondary sources from various banks used in the study. The findings are presented according to the objectives of the research. The various results are presented using various descriptive statistics and regression. Various tables and figures were used to add value to the statistical analysis.

4.1 Key Determinants of total liability to total asset ratio in Ghana

In line with the research objectives, the various data obtained from the banks were subjected to analysis based on the variables under study. These include the energy sector loans, capital adequacy ratio, bank size, non-performing loans and solvency ratio (total liability to assets ratio).

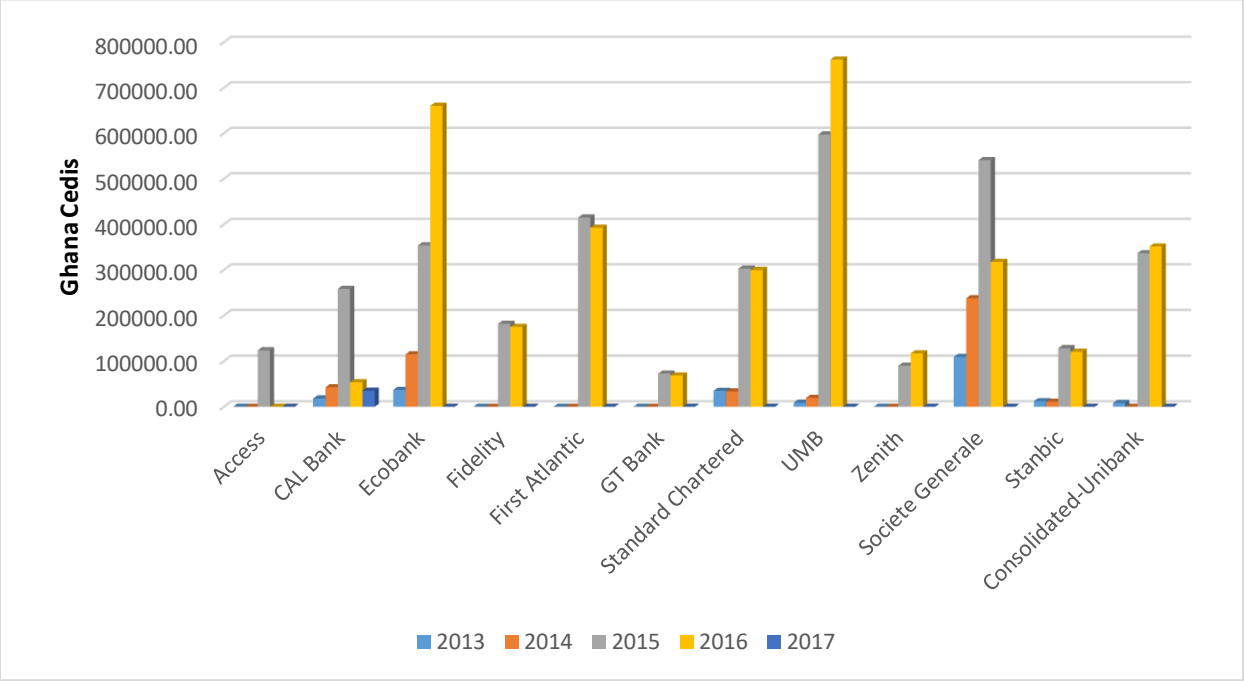
4.1.1 Energy Sector Loans

The results reveal that of all the financial institutions used in the study, in the year 2013, Societe Generale provided the highest amount of energy sector loans when compared to the rest of the financial institutions with GH₵109,247,000. They are followed by Standard Chartered Bank with Gh₵34,899,000. In 2014 again, Societe Generale had the highest with GH₵237,774,000 followed by Ecobank with Gh₵114,958,000 and Cal Bank with Gh₵42,757,000. The financial company that provided the least in 2015 was GT Bank with Gh₵72,635,000 and the highest was that of UMB bank with Gh₵597,403.294. The highest for 2016 and 2017 were UMB bank and Cal Bank with Gh₵762,139,000.30 and Gh₵35,084.00 respectively. Comparing the various

years, the results indicate that the year with the highest amount of revenue given out by any of the financial institutions is by UMB in 2016.

Analysis of energy sector loans for the various financial institutions from 2013 to 2017 is displayed in figure 1 below.

Figure 1: Energy Sector Loans



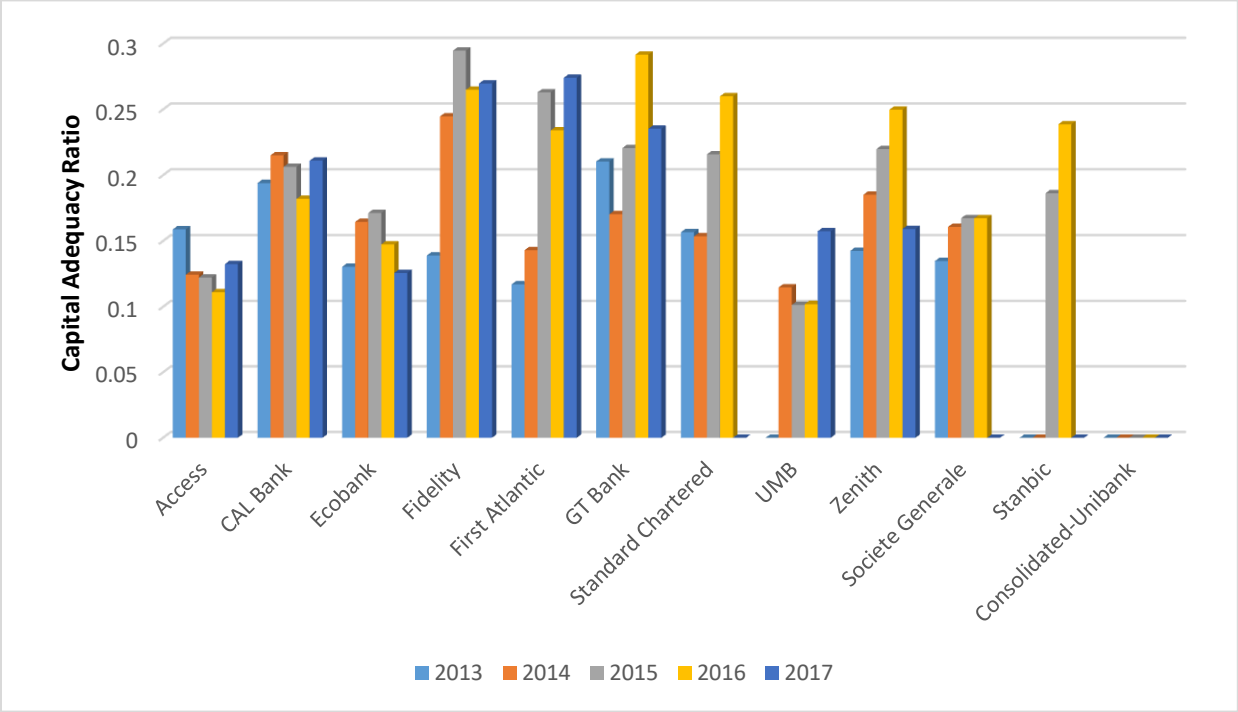
(*Source: Author computation based on Secondary Data, 2019)*

4.1.2 Capital Adequacy Ratio

The analysis of the capital adequacy ratios of the financial institutions provides the following results. Considering all the years and across all the financial institution, the one that had the highest ratio was in 2015 by Fidelity with 0.2946 followed by GT bank in 2016. In terms of performance for each year, 2013 had GT Bank obtaining the highest with 0.2104 whiles in 2014 it was obtained by Fidelity with 0.2446. The year 2016 had GT Bank obtaining the highest with 0.2916. First Atlantic bank had the highest in 2017 with 0.274.

Figure 2 below is the graph of capital adequacy ratios of the various banks from 2013 to 2017.

Figure 2: Capital Adequacy Ratio



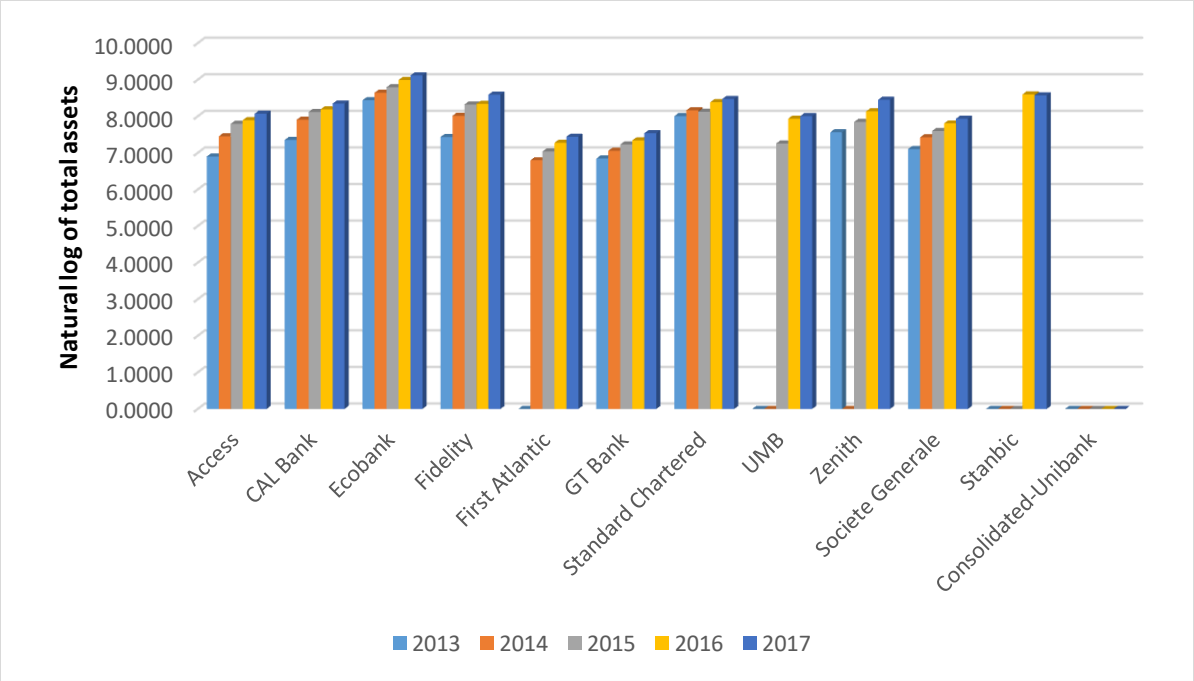
(*Source: Author computation based on Secondary Data, 2019)*

4.1.3 Size of Financial Institution

The size of a financial institution which was calculated as the natural log of the institution's total assets reveals that in 2013, Ecobank had the highest with 8.439 followed by Standard Chartered Bank with 8.002. Ecobank and standard Chartered banks again were the highest and second highest in 2014 with 8.6429 and 8.1622 respectively. Fidelity Bank, however, took the second-highest from Standard Chartered bank in 2015 with 8.322 whiles Ecobank maintained the lead with the highest with 8.793. In 2016, Stanbic Bank took over the second-highest position from Fidelity with 8.792 whiles Ecobank again continues to have the largest with 8.990. The highest and second highest in 2017 were Ecobank and Fidelity bank respectively with 9.116 and 8.590

respectively. Ecobank had the highest for all the years under consideration. The various sizes of the financial institutions were analyzed to provide results that are displayed in Figure 3 below.

Figure 3: Size of Banks

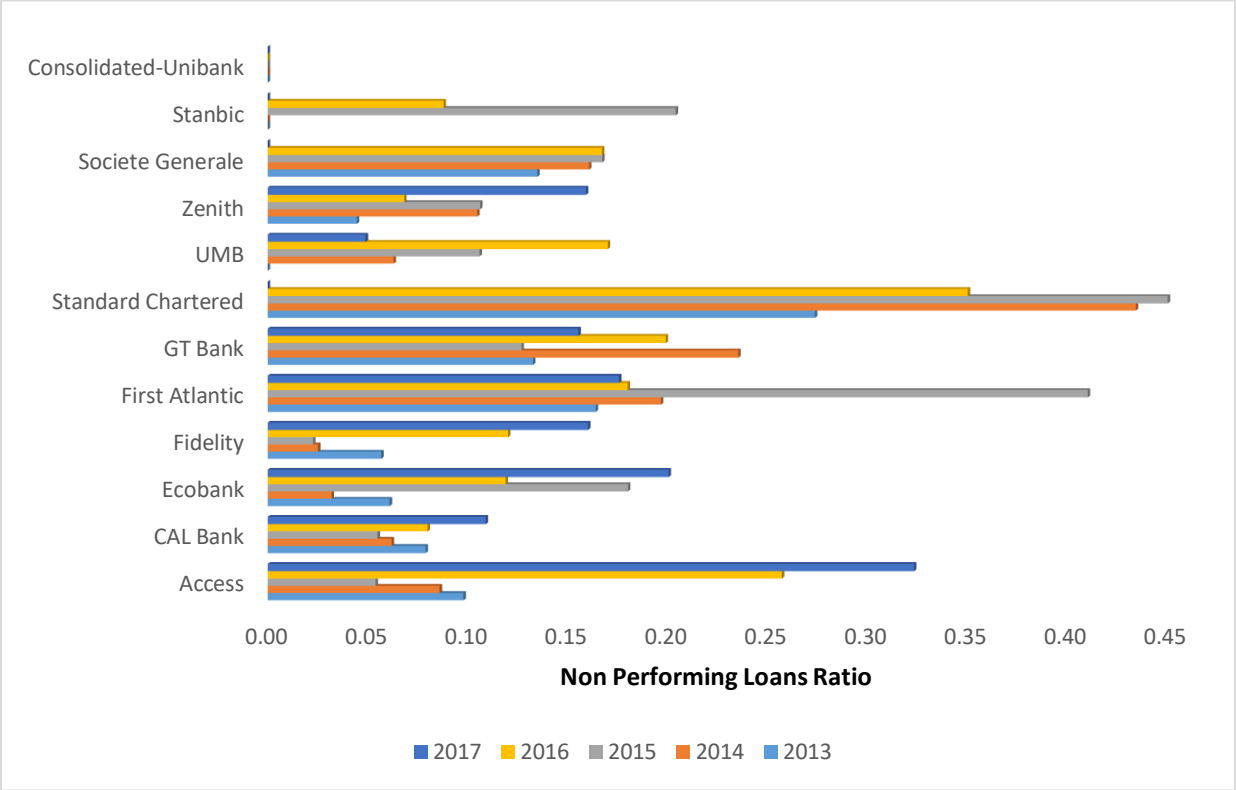


(*Source: Author computation based on Secondary Data, 2019)*

4.1.4 Non-Performing Loans

The graphical presentation of NPLs for the sampled banks for the various years is in figure 4. According to the results in figure 4, generally, the institution that recorded the highest non-performing loans ratio is Standard Chartered Bank with 0.45 followed by First Atlantic Bank with 0.41 in 2015. In terms of year to year analysis, Standard Chartered Bank recorded the highest value (0.27) relative to each of the banks in 2013. The year 2014, Standard Chartered Bank again recorded the highest value of NPLs (0.43) followed by GT Bank with 0.23. In 2016, Access was the second highest after Standard Chartered Bank with 0.26. In 2017 however, Access bank had the highest ratio of 0.32.

Figure 4: Non-Performing Loans

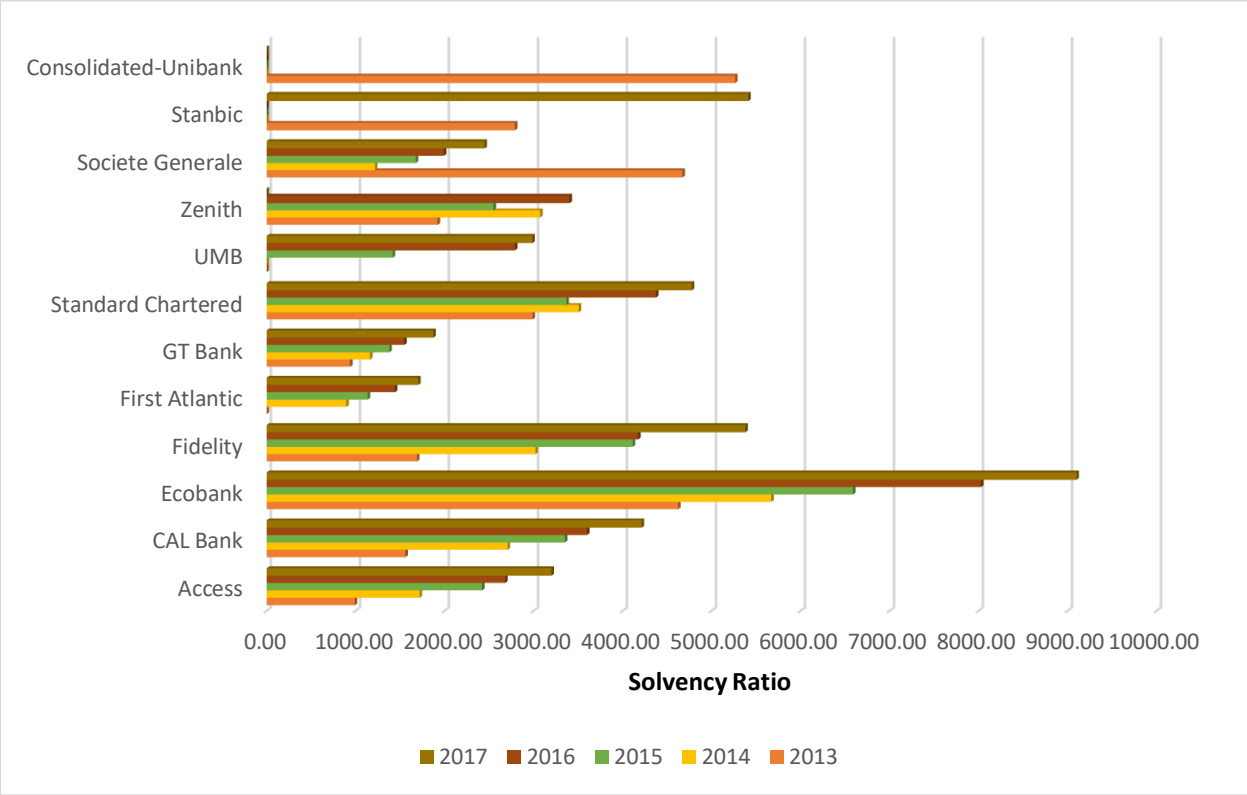


(*Source: Author computation based on Secondary Data, 2019)*

4.1.5 Solvency Ratios (Total Liability to Total Asset Ratio)

Summary of the solvency ratio of the selected banks is presented in figure 5. The bar chart in figure 5 clearly shows that overall, Ecobank had the highest solvency ratio when compared to the rest of the financial institutions. This occurred in the year 2017. Also, for all the years, Ecobank had the highest solvency ratio apart from 2013 where Societe Generale had the highest with 4671. The second highest in the year 2013 was Ecobank with 4624. In 2014, Zenith Bank had the second highest with 3073. With a ratio of 4114, Fidelity Bank had the second-highest ratio in 2015. Standard Chartered and Fidelity were the second-highest for 2016 and 2017 with 4374 and 5378, respectively.

Figure 5: Solvency Ratios



(*Source: Author computation based on Secondary Data, 2019)*

4.1.6 Descriptive analysis of key determinants of solvency Ratio

Table 1 below provides the descriptive data of the various variables for all the financial institutions used for the study. According to the table, N, representing the total number of observations is 60. This means 5 years each for 12 banks used in the study. With regards to the mean variation the result shows that the highest average value was recorded by energy sector loans (124081.7), followed by total liability to total asset ratio indicated as (3133.082), next to this was Bank Size (7.890). The least is that of Non-Performing Loans (0.152).

Table 1: Descriptive analysis of key determinants of solvency Ratio

Variables	N	Min	Max	Mean	ST. Dev
Energy Sector Loans	60	0.001	762139.300	124081.7	184794.9
Capital Adequacy Ratio	60	0.101	0.295	0.185	0.0540
Bank Size	60	6.797	9.116	7.890	0.578
Non-Performing Loans	60	0.023	0.45	0.152	0.103
Total liability to total asset ratio	60	895	9099	3133.082	1823.89

(*Source: Writer's Computation, 2019)*

4.1.7 Specification of Econometric Models

Natural logarithm was applied to the various data obtained from the banks before being subjected to regression test to determine the impact the various variables have on solvency ratio. For the purposes of this study, the model employed is the fixed effect model based on the outcome of the Hausman test, which is reported in Table 2.

Table 2: Results of regression of various variables on solvency ratio

	Total Liability to Total Asset Ratio		
Variables	Model (β)	P-value	Standard error
Energy Sector Loan	-0.003	0.384	0.004
Capital Adequacy Ratio	-0.534	0.014	0.210
Size of Banks	1.510	0.000	0.048
Non-Performing loans	0.154	0.042	0.073
R^2	0.613		
Adjusted R^2	0.603		
Constant	4.391	0.000	0.344
F-test	10.66	0.000	
Hausman Test Statistic	19.46	0.001	

(Source: Writer's Computation, 2019)

The results based on the Hausman test reject the null hypothesis that the random effect model is the appropriate model for the data generation process at any of the conventional significance

level. The p-value of the test statistic is 0.001, which is less than even the 10 percent significance (0.1) level, implying that the null hypothesis is rejected even at the conservative 10 percent significance level. Based on the outcome of the test, the fixed effect model was chosen as the main model for the regression analysis for the sample data of the study.

4.1.8 Impact of various variables on solvency ratio

Table 2 above contains the results of the regression to examine the impact that the various variables on solvency ratio using 5% significant level. The results reveal that energy sector loans do not have any significant effect on solvency ratio, since the p-value (0.384) is greater than 0.05, suggesting that the null hypothesis that the estimated coefficient value (-0.003) is not statistically different from zero cannot be rejected at the 5% significance level. This means that with an increase or decrease in energy sector loans does not have any effect on solvency ratios of banks. Again, the results indicate that Capital Adequacy ratio has a negative significant effect on solvency ratio at the 5% level, with elasticity value of -0.534. This implies that when capital adequacy ratio increases, it could lead to a decrease in the solvency ratio. The size of banks was found to significantly affect solvency ratio positively, with an elasticity value of 1.510, which is significant at any of the conventional significance levels. This implies that if the size of the banks increases, it would lead to an increase in the solvency ratio. Non-Performing loans was found to significantly affect solvency ratio, with elasticity value of 0.154.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the main findings of the study, conclusions, and recommendations. It covers the summary of the study, major findings of the research, and the the conclusion and recommendations.

5.1 Summary

This study contributes to the empirical literature on the impact of energy sector debt on Bank's liability ratio using annual financial reports of commercial banks from the period of 2013 to 2017. Banks are considered the most important financial institution in Ghana. One of their primary functions is lending to the public or other institutions. However, they are currently faced with solvency issues in Ghana. Some have attributed this problem to loans contracted by the energy sector SOEs. The energy sector has experienced tremendous growth in the past year in line with rapid population growth in the country. The increase in demand sometimes leads to the inability of the SOEs to meet the user's needs and therefore increases its operational cost. They, therefore, borrow from both domestic and external sources to finance its operations.

This study seeks to address these challenges by investigating if borrowings from these energy sectors SOEs contribute significantly to the challenges being faced by the banks. In line with the research objectives, the study used secondary data obtained from various banks were subjected to analysis based on the variables under study. These include the energy sector loans, capital adequacy ratio, bank size, non-performing loans and solvency ratio (total liability to total assets ratio).

The second objective was to also determine other factors that affect solvency ratio of banks in Ghana with Liabilities to Assets Ratio used as a proxy. Overall, the study found that Energy Sector Loans do have a major impact on Banks liabilities Ratio.

5.2 Major Findings

The major findings attained from the model using the random effect model based on the outcome of Hausman test are indicated below:

- Energy sector loans do not have any significant effect on solvency ratio. An increase or decrease in energy sector loans will not have any effect on banks liability ratios of banks based on the results of the regression.
- It was also found that, capital adequacy ratio has a negative effect on the liability ratio of banks indicating that when capital adequacy ratio increases, it have a negative significant effect on the liability ratio.
- The size of banks was found to significantly affect solvency ratio (liability ratio) positively. Thus, an increase in the size of banks will lead to an increase in the solvency ratio
- Non-Performing loans was found to significantly affect solvency ratio positively and is therefore a key determinant in determining the liability ratio of banks.

5.3 Conclusion and Recommendations

The research succeeded in achieving its stated objectives which sought to determine the impact of the energy sector debt on a bank's liability to assets ratio. Analyzing the financial performance of banks with regard to the loans borrowed by the energy sector, the main objective

of the study was to investigate the relationship between energy sector loans and liability ratio of banks. In addition, to find out the factors that increases the liability ratio of banks in Ghana. From the empirical analysis, the research findings confirmed that high non-performing loans has a positive effect on a bank's solvency ratio, however, energy sector loans, have no significant effect on solvency ratio. It was also found that, a high capital adequacy ratio has a significant negative impact on banks liabilities to asset ratio.

This section suggests the following recommendations to both the energy sector and state-owned enterprises for consideration. SOEs must operate efficiently to reduce their operating cost so as not to increase their borrowings to finance its operations since this can increase the non-performing loan ratio of banks. Also, it is important for banks to reduce its non-performing energy sector loans and its non-performing loan ratio as this increases their solvency ratio (liability ratio). It is important for the banks to take a proactive role in ensuring the required capital adequacy ratio is maintained to minimize its risk of solvency. This can be done by replacing riskier loans with safer loans in order to reduce its risk-weighted assets.

REFERENCES

Abusharbeh, M. T. (2017). The Impact of Banking Sector Development on Economic Growth: Empirical Analysis from Palestinian Economy. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB)*, *6*(2), 2306-2316.

Altaylıgil, Y. B., & Akkay, R. C. (2013). The effect of the domestic debt on the financial development: a case study for Turkey. *International Journal of Economics and Finance*, *5*(5).

Altunbas, Y., Liu, M. H., Molyneux, P., & Seth, R. (2000). Efficiency and risk in Japanese banking. *Journal of Banking & Finance*, *24*(10), 1605-1628.

Amuakwa–Mensah, F., & Boakye–Adjei, A. (2015). Determinants of non–performing loans in Ghana banking industry. *International Journal of Computational Economics and Econometrics*, *5*(1), 35-54.

Annual Debt Management Report (Rep.). (2017). doi:https://www.mofep.gov.gh/sites/default/files/reports/economic/2017-Annual-Debt-Management-Report.pdf

Annual Report on the Management of the Energy Sector Levies and Accounts for the year 2016. (n.d.). Retrieved February 26, 2019, from https://www.eslaplc.com/pages/download/2016_Annual_Report_on_the_management_of_Energy_sector_levies-0.pdf

Anyanwu, A., Gan, C., & Hu, B. (2017). Government Domestic Debt, Private Sector Credit, and Crowding Out Effect in Oil-Dependent Countries. *Journal of economic research*, *22*(2), 127-151.

Araka, H., Mogwambo, V., and Otieno, S., (2018). Effect of Non-Performing Loans on Financial Performance of Commercial Banks in Kenya. *International Journal of Finance, Accounting and Economics (IJFAE) 1* (3), 44-51.

Avkiran, N. K., & Cai, L. C. (2012). Predicting bank financial distress prior to crises. In *New Zealand Finance Colloquium*.

Banking Sector Report (Vol. 2.3, Rep.). (2017). Retrieved 26 February, 2019, from https://www.bog.gov.gh/privatecontent/MPC_Press_Releases/Banking Sector Report - July 2017.pdf

Barnor, C., & Odonkor, T. A. (2012). Capital adequacy and the performance of Ghanaian banks. *Journal of Business Research*, *6*(1-2), 105-117.

Bernstein, D. (1996). Asset quality and scale economies in banking. *Journal of economics and Business*, *48*(2), 157-166.

Bertelsen, K., & Sedlacek, M. (2014). Energy Sector Overview.

Feyen, E., Fiess, N., Huertas, I. Z., & Lambert, L. (2017). *Which emerging markets and developing economies face corporate balance sheet vulnerabilities?: a novel monitoring framework*. The World Bank.

Curry, T. J., Elmer, P. J., & Fissel, G. S. (2003). Using market information to help identify distressed institutions: a regulatory perspective. *FDIC Banking Rev.*, *15*, 1.

Domanski, D., Kearns, J., Lombardi, M. J., & Shin, H. S. (2015). Oil and debt. *BIS Quarterly Review March*.

Drigă, I., & Dura, C. (2014). The financial sector and the role of banks in economic development. In *6th International Multidisciplinary Symposium "Universitaria SIMPRO. Retrieved from https://www. upet. ro/simpro/2014/proceedings/09*.

Elliott, D. J. (2014). Bank liquidity requirements: An introduction and overview. *The Brookings Institution*.

Feyen, E., Fiess, N., Huertas, I. Z., & Lambert, L. (2017). *Which emerging markets and developing economies face corporate balance sheet vulnerabilities?: a novel monitoring framework*. The World Bank.

Gennaioli, N., Martin, A., & Rossi, S. (2014). Sovereign default, domestic banks, and financial institutions. *The Journal of Finance*, *69*(2), 819-866.

Gersl, A., & Hermanek, J. (2007). Financial stability indicators: advantages and disadvantages of their use in the assessment of financial system stability. *Occasional Publications-Chapters in Edited Volumes*, 69-79.

Gibson, B., & Cassar, G. (2005). Longitudinal analysis of relationships between planning and performance in small firms. *Small Business Economics*, *25*(3), 207-222.

Girardone, C., Molyneux, P., & Gardener, E. P. (2004). Analysing the determinants of bank efficiency: the case of Italian banks. *Applied Economics*, *36*(3), 215-227.

Hamed, O. (2017). *Government Borrowing and liquidity and the stability of the Palestinian banking system*. MAS-Discussion Paper. Ramallah.

Horváth, R., Seidler, J., & Weill, L. (2014). Bank capital and liquidity creation: Granger-causality evidence. *Journal of Financial Services Research*, *45*(3), 341-361.

Ikpefan, O. A. (2013). Capital adequacy, management and performance in the Nigerian commercial bank (1986-2006). *African Journal of Business Management*, *7*(30), 2938-2950.

Karim, M. Z. A., Chan, S. G., & Hassan, S. (2010). Bank efficiency and non-performing loans: Evidence from Malaysia and Singapore. *Prague Economic Papers*, *2*(1), 118-132.

Kennedy-Darling, J., Hoyt, N., Murao, K., & Ross, A. (2008). The energy crisis of Nigeria: an overview and implications for the future. *The University of Chicago, Chicago*, 775-784.

King, T. B., Nuxoll, D., & Yeager, T. J. (2005). Are the causes of bank distress changing? Can researchers keep up?. *FRB of St. Louis Supervisory Policy Analysis Working Paper*, (2004-7).

Levine, R., & Zervos, S. (1999). *Stock markets, banks, and economic growth*. The World Bank.

Lotto, J. (2018). The empirical analysis of the impact of bank capital regulations on operating efficiency. *International Journal of Financial Studies*, *6*(2), 34.

Mba, P. N., Yuni, D. N., & Oburota, C. S. (2013). Analysis of domestic debt: implication for economic growth in Nigeria. *Global Journal of Social Sciences*, *12*(1), 1-9.

Mech, J. Theoretical foundations and practical applications of municipal debt regulation (focusing on the situation in the Czech Republic). *Debt Management in Transition Countries: Experience and Perspectives*, 241.

Mester, L. J. (1996). A study of bank efficiency taking into account risk-preferences. *Journal of banking & finance*, *20*(6), 1025-1045.

Mhadhbi, K., Terzi, C., & Bouchrika, A. (2017). Banking sector development and economic growth in developing countries: a bootstrap panel Granger causality analysis. *Empirical Economics*, 1-20.

Nimalathasan, B. (2008). A comparative study of financial performance of banking sector in Bangladesh. An application of CAMELS rating system. *Universitatii Bucuresti. Analele. Seria Stiinte Economice si Administrative*, *2*, 133.

Nouaili, M. A., Abaoub, E., & Anis, O. C. H. I. (2015). The determinants of banking performance in front of financial changes: Case of trade banks in Tunisia. *International Journal of Economics and Financial Issues*, *5*(2), 410-417.

Odundo, O. G., & Orwaru, M. J. Bank Size and Financial Stability of Commercial Banks in Kenya: Empirical Evidence.

Ondo, A. (2017). Public debt and financial stability: The case of economic community and monetary union of central Africa (EMCCA). *Journal of Economics and International Finance*, *9*(9), 89-94.

Popov, A. A., & Van Horen, N. (2013). The impact of sovereign debt exposure on bank lending: Evidence from the European debt crisis.

Ragonmal, L. (2016). *Impact of commercial banking sector development on economic growth in small Pacific countries: a case study of the Vanuatu economy* (Doctoral dissertation, Lincoln University).

Raut, R., Cheikhrouhou, N., & Kharat, M. (2017). Sustainability in the banking industry: A strategic multi-criterion analysis. *Business Strategy and the Environment*, *26*(4), 550-568.

Roman, A., & Şargu, A. C. (2013). Analysing the financial soundness of the commercial banks in Romania: an approach based on the camels framework. *Procedia economics and finance*, *6*, 703-712.

Sebe-Yeboah, G., & Mensah, C. (2014). A critical analysis of financial performance of Agricultural Development Bank (ADB, Ghana). *European journal of accounting auditing and finance research*, *2*(1), 1-23.

Simpasa, A., & Pla, L. (2016). Sectoral Credit Concentration and Bank Performance in Zambia. *African Development Bank Group*.

Subačienė, R., & Villis, L. (2010). A system of analysis of the total liabilities to total assets ratio. Ekonomika, 89(2), 120-129.

Swianiewicz, P. (Ed.). (2004). *Local government borrowing: Risks and rewards*. Open Society Institute.