CREDIT RISK AND PROFITABILITY OF LISTED BANKS IN GHANA

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MAY 2019
DECLARATION

I do hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any other university. All references used in the work have been fully acknowledged.

I bear sole responsibility for any shortcomings.

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DATE
CERTIFICATION

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

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SAINT KUTTU (PhD)..........................................................................................DATE

(SUPERVISOR)
DEDICATION

I dedicate this work to almighty ALLAH to Him be the Glory for the unimaginably great things HE continues to do in my life.

Also I dedicate this to my family especially my son, Abdul Muhaymeen.
ACKNOWLEDGEMENT

I wish to acknowledge all those who did contribute in diverse ways to make this thesis a success.

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TABLE OF CONTENTS

DECLARATION .................................................................................................................. i
CERTIFICATION ............................................................................................................. ii
DEDICATION .................................................................................................................. iii
ACKNOWLEDGEMENT ................................................................................................. iv
TABLE OF CONTENTS ..................................................................................................... v
LIST OF TABLES .............................................................................................................. viii
LIST OF FIGURES .......................................................................................................... ix
ABSTRACT ...................................................................................................................... x
CHAPTER ONE ................................................................................................................. 1
INTRODUCTION .............................................................................................................. 1
  1.1 Background of Study .............................................................................................. 1
  1.2 Problem Statement .............................................................................................. 3
  1.3 Research Objectives ............................................................................................. 3
  1.4 Research Questions ............................................................................................. 3
  1.5 Significance of Study ........................................................................................... 4
  1.6 Research Limitations ........................................................................................... 5
  1.7 Organisation of Study .......................................................................................... 5
CHAPTER TWO ................................................................................................................. 6
LITERATURE REVIEW .................................................................................................... 6
  2.1 Introduction .......................................................................................................... 6
  2.2 Theoretical review ............................................................................................... 6
2.2.1 Agency Theory and credit risk ................................................................. 6
2.2.2 Theory of Information Asymmetry and Information Sharing .................... 7
2.3 Empirical review ......................................................................................... 8
2.3.1 Determinants of Bank credit risk ............................................................ 8
2.3.2 Some Literature on Bank Credit Management Practices ............................. 9
2.4 Overview of the Ghanaian banking system ................................................. 10
2.5 Chapter summary ....................................................................................... 11

CHAPTER THREE ............................................................................................... 12
METHODOLOGY ................................................................................................. 12
3.1 Introduction ................................................................................................. 12
3.2 Research Design ......................................................................................... 12
3.3 Sampling and sources of data ...................................................................... 12
3.4 Profitability Analysis .................................................................................. 13
3.4.1 Return on Assets (ROA) ......................................................................... 13
3.5 Variable Measurements and Model Specification ........................................ 14
3.5.1 Bank size ............................................................................................... 15
3.5.2 Ownership structure .............................................................................. 16
3.5.3 Leverage ............................................................................................... 16
3.5.4 Competition .......................................................................................... 16
3.6 Data Analysis Technique .......................................................................... 17

CHAPTER FOUR .................................................................................................. 18
DATA ANALYSES AND DISCUSSION OF FINDINGS ....................................... 18
4.1 Introduction ............................................................................................... 18
4.2 Description of data .................................................................................... 18
4.3 Profitability of Listed Banks ....................................................................... 19
### 4.4 Correlation Analysis .................................................................21

4.4 Regression Analyses ........................................................................23

#### 4.4.1 Credit risk and Profitability ......................................................24

#### 4.4.2 Ownership and Profitability ......................................................24

#### 4.4.3 Size, Leverage and profitability ..................................................25

#### 4.4.4 Competition and Performance ...................................................25

#### 4.4.5 Interest rates and Profitability ....................................................25

#### 4.5 Summary ......................................................................................26

### CHAPTER FIVE ..................................................................................27

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .......................27

#### 5.1. Introduction ..................................................................................27

#### 5.2 Summary of the study ....................................................................27

#### 5.3 Summary of Findings ......................................................................28

#### 5.4 Recommendations ..........................................................................29

### REFERENCES ....................................................................................31
LIST OF TABLES

Table 4.1 Descriptive statistics .................................................................19
Table 4.2 Return on Assets (ROA) for each Bank over Time Period......................20
Table 4.3 (Correlation Matrix) ......................................................................22
Table 4.4 Regression Results........................................................................24
LIST OF FIGURES

Figure 4.1 Mean ROA of Listed Banks.................................................................21
ABSTRACT

This research assesses the relationship between credit risk and the performance of listed banks in Ghana. The data sample consisted of 8 listed banks covering a 7-year period from 2010 to 2016.

Findings from the study reveal that total assets and liabilities on average increased over the seven (7) years period. But this increase has been almost in the same proportion, leading to an almost constant leverage ratio over the period. On the average, the ROA of most of the banks increased over time. An explanation for this could be that liquid assets, total assets, shareholder’s fund and total comprehensive income have on average augmented over the years. Size formed the highest correlation with ROA, followed by board independence and leverage in that order.

The regression result revealed a negative impact of credit risk on performance. A unit increase in the credit risk of banks will lead to a 0.0324 units decrease in the return on assets. Bank size had a positive impact on performance. The positive relationship implied that larger banks perform better over time than smaller banks.
CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Financial institutions play a major role in the development of any country in both developed and developing countries. By mobilizing domestic savings from depositors, banks provide resources to individuals and business units who in turn use these resources for investment and productive activities that promote economic development. Besides this intermediation role, banks continue to provide innovative financial products to investors that lower transaction costs and facilitates payment systems (Maxwell, 1995).

The performance of the financial sector is, therefore, pivotal to the growth of any contemporary economy (Thankom Gopinath Arun & Turner, 2009; T. G. Arun & Turner, 2002; Demirgüç-Kunt, 2004). The activities of financial institutions like banks drive other sectors of the economy particularly through money lending (PWC, 2017). Therefore their performance ripples into economic growth (Ataullah & Le, 2006). Empirical studies have documented a positive relationship between the performance of financial institutions and economic growth and development (Beck & Levine, 2004; Beck, Levine, & Loayza, 2000). The financial sector’s significance is apparent in its substantial contribution to gross domestic product (GDP) (Haldane, Brennan, & Madouros, 2010). In Ghana, for example, the financial and insurance subsector contributed 8.4%, 8.9% and 9.4% to GDP in 2014, 2015 and 2016 respectively (GSS, 2017). In the financial sector, banks are considered the most significant due to the crucial role they play in financial intermediation. Hence, their contribution to the economy cannot be overlooked. The banking sub-sector in Ghana contributed about 75% of the assets of the financial sector in 2011 (Alhassan, 2015). Banks mobilize funds from surplus spending units (depositors) and allocate...
them to deficit spending units (borrowers), to enhance economic growth (Ataullah & Le, 2006; Levine, Loayza, & Beck, 2002).

To be able to sustain the performance of these roles in an economy, banks must be able to generate enough earnings in for business survival and continuity. Profitability is a concept that is at the Centre stage of discussion when one talks of how banks should earn enough earnings to remain in business. Profitability is in turn affected by several internal and external factors. Largely, banks have control of internal factors also known as bank specific variables that tend to shape profitability levels. Among other things, liquidity is one of the key internal factors that influence profitability of banks. Generally, the term liquidity refers to the ability to fund increases in assets and meet obligations as they fall due.

Credit risk can be described as the risk of default on the part of borrowers to pay back sums borrowed (Hafsa Orhan Astrom, 2013; Richard, Chijoriga, Kaijage, Peterson, & Bohman, 2008). Since the UT and Capital Bank takeovers, one growing phenomenon taking strides in the banking sector is the credit risk management of banks in Ghana and how they impact their performance. Banks generate more income from credit creation, but this comes with several risks. Amongst those several risks, credit risk proves to be so inevitable in the credit creation process (Eccles, Herz, Keegan, & Phillips, 2001), and can really interrupt the smooth running of a bank’s business. Excessively high level of non-performing loans in the banks can be attributed to poor corporate governance practices, loose and negligent credit administration processes and the absence or non-adherence to credit risk management practices. Bad credit risk management has been identified to be a recipe for disaster, a reason for which some banks go bankrupt. It is for this reason that this study wants to determine the close nexus between credit risk management practices of banks in Ghana and how they ultimately affect performance.
1.2 Problem Statement

There are quite a proliferation of studies worldwide that have considered the link between credit risk management (Andreou, Cooper, Louca, & Philip, 2017; Fayman & He, 2011; Freeman, Cox, & Wright, 2006; Hafsa Orhan Astrom, 2013; J. Jin, Yu, & Mi, 2012; Kolapo, Ayeni, & Oke, 2012; Treacy & Carey, 2000) but most of them are on developed economies. There’s only quite a few domestically (Apanga, Appiah, & Arthur, 2016; Boahene, Dasah, & Agyei, 2012). Even though the issue of credit risk and its management is becoming very essential in policy debates, research in the area in developing countries is still in its infancy (Apanga et al., 2016). With the recent bankruptcy issues and recent takeovers involving UT and Capital Banks, the merging of some local banks, the financial soundness of the Ghanaian banking system has been called to question and needs to be carefully assessed. One way of examining the financial soundness of these banks is by examining their credit risk management practices and measuring the general immunity of the banking industry toward such risk, hence further research needed in such sensitive area.

1.3 Research Objectives

The overall objective of this research is to assess the relationship between credit risk and the profitability of listed banks in Ghana. The specific objectives include:

- To measure the profitability of listed banks from 2010 to 2016.
- To determine the linkage between credit risk and non-performing loans.
- To evaluate the effect of credit risk and profitability of listed banks from 2010 to 2016.

1.4 Research Questions

The study seeks to answer the following questions:

a. In what way is credit risk linked with non-performing loans?
b. To what extent does credit risk impact bank profitability?

1.5 Significance of Study

The outcomes of the research have direct implications for policy, practice and academic works. Findings of the study will make relevant contribution to decision making among banks, investors, and banking industry regulators alike. Among listed banks, findings of the study will serve as a guide in decision making in particularly decision regarding optimal decision levels that must be held. From the bank perspective, findings of the study will lead to a better understanding of the nature of relationship between credit risk and their performance. This empirical knowledge can help to the formulation of financing decisions pertaining to credit risk that help improve the profitability of banks. For investors, results of the study can enhance decision making regarding which firms to invest. Investors can gauge the liquidity and profitability performance of listed firms by dwelling on the results of the study in order to make informed decisions.

Policy wise, by empirically assessing the performance of the Ghanaian banking industry, regulators, that is, the Bank of Ghana (BOG) is further informed about the financial health of the industry. The BOG is well-informed regarding the trends and patterns as well as the potential drivers of profitability. The analysis may provide insights towards potential avenues for policy prescriptions and enhancement which can then be oriented towards specific less-performing and more-performing banks and the whole industry.

To academic literature, the research contributions are in a few folds. First, the first study contributes to the few credit risk management and performance literature in the Ghanaian banking industry and Africa at large. Second, the study attempts to provide a new empirical evidence on the nexus between credit risk, non-performing loans and bank performance. Again, the study will make relevant contributions to existing literature on the effect of credit risk on performance of
banks. The results of the study consequently will serve as a guide and source of reference material for future researchers.

1.6 Research Limitations

Despite the contributions this study makes towards research, policy and practice, it still faces some challenges. First, the performance of banks can be further examined by means of efficiency measures other than ratios, which will be considered in another study. Second, the focus of this study is limited to the banking sector while ignoring the other parts of the financial system such as microfinance institutions, even though there seem to be little research focusing on such areas. Due to data unavailability however, it is difficult to include such institutions in the study. That notwithstanding, the study is representative since the Ghanaian financial system is dominated by banks and is the driving force of the financial system (Buchs & Mathisen, 2005).

1.7 Organisation of Study

The study is categorised into five chapters, each with sections and potential subsections. The first chapter focuses on the background of the study, problem statement, objectives, questions, research significance, and the scope within which the study is confined. Chapter two reviews the relevant literature on performance studies in banking in order to provide evidence to support the purpose of the research and seek answers to research questions. It also gives a brief discussion of the industry, the regulations, and the structure of the firms within the industry. In chapter three, the methodology of the research is discussed, detailing main ratios to be deployed. Chapter four entails data presentation, analyses of results, conducting of tests, and making graphical illustrations. The final chapter discusses, summarises, concludes, makes recommendations and proposes directions for further research.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction
This chapter reviews theoretical underpinnings on credit risk management and some empirical studies related to the current study. Whereas the theoretical review presents the theoretical basis for the study with relation to credit risk management, the empirical review presents the current state of research relating to credit risk management and the various methods employed in this study and their relation to bank performance.

2.2 Theoretical review
This section presents the theoretical basis of the study. It explains the theories upon which this research is grounded. There are quite a number of theories trying to explain the concept of credit risk and its management, but this study focuses mainly on the agency theory (M. C. Jensen & Meckling, 1976) and the theory of asymmetric information (Ncube & Senbet, 1997) and information sharing.

2.2.1 Agency Theory and credit risk
M. C. Jensen and Meckling (1976) initiated the agency theory building on the earlier works of Fama and Miller (1972). The theory spells out a conflict of interest between owners of firms who act as principals, and managers who also act as agents. Managers tend to have the tendency to put free cash flow to waste if not monitored. Hence, the higher a manager’s discretionary funds available to him, the greater the likelihood of empire building (Michael C Jensen, 1986). This implies that, managers can act in the bad interest of firm, engaging in poor projects.
The agency problem in has been tagged as a mechanism that affects firm-level risk. Some authors including L. Jin and Myers (2006) and Hutton, Marcus, and Tehranian (2009) observe that the probability of cash risk (greater negative stock returns) is increased by accounting opacity. They develop an imperfect information model where managers are willing to hide firm-specific negative news when the cost of hiding outweighs the benefit, in which they proved the unsustainability of hiding adverse news for a long period (Bleck & Liu, 2007; Kothari, Shu, & Wysocki, 2009). Managers, within such an unfavorable environment, might be able to overstate and manipulate financial performance by means of withholding bad news.

Conservatism within firms, in a similar vein, like banks can act as a CG mechanism to prevent the accumulation of any hidden adverse news that could result in less crash risk. This linkage, however, may be weaker within banks as a result of high regulatory supervision and scrutiny. In addition, with the fact that banks are highly leveraged organizations, and due to their contracting demands, litigation costs and preferences of regulators, we would also expect such firms to portray and showcase higher levels of conditional conservatism (Armstrong, Guay, & Weber, 2010; Watts, 2003).

2.2.2 Theory of Information Asymmetry and Information Sharing

Previous reviews on the theories of credit management have asserted information asymmetry (IA) to be the root cause of credit risks of banks or non-performing loans (Freimer & Gordon, 1965; Freixas & Rochet, 1997, 2008; Stiglitz & Weiss, 1987). IA could be viewed as the lack of comprehensive and complete credit information between surplus spending units (lenders) and deficit spending units (borrowers) in the credit market (Aumann, 1987; Freixas & Rochet, 1997; Myerson, 2013). IA breeds adverse selection and moral hazard in processing and issuance of bank
loans (Kusi, Agbloyor, Ansah-Adu, & Gyeke-Dako, 2017). But some researchers have argued that this problem can be reduced. In their respective studies, some notable researchers Gehrig and Stenbacka (2007), Padilla and Pagano (1997), Padilla and Pagano (2000), Pagano and Jappelli (1993) and Kallberg and Udell (2003) suggested that the effect of information asymmetry can be reduced by means of information sharing in the credit market which tends to minimize moral hazard and adverse selection (Gehrig & Stenbacka, 2007; Kallberg & Udell, 2003; Padilla & Pagano, 1997, 2000; Pagano & Jappelli, 1993). Thus the absence of a comprehensive, reliable and accurate credit information among parties of credit is reduced as lenders or banks share credit information. The resulting effect of the reduced information asymmetry emanating from vital credit information sharing among banks through private bureaus or public registries help banks to lessen the rate of moral hazard and adverse selection. That is, collection of credit or financial data, processing and reporting of data on credit worthiness of organizations and individuals by these registries and bureaus at the request of banks. In theory, these credit bureaus and registries seem to be perfect substitutes, empirical studies assert that private credit bureaus are more effective (Miller, 2003; Singh, 2010; Triki & Gajigo, 2012).

2.3 Empirical review

2.3.1 Determinants of Bank credit risk

A few researchers have tried to draw a link between bank credit risk and some related causal factors. One of those researchers are Gizycki and Gizycki (2001) who examined the overall variability of Australian banks’ credit risk-taking in the 1990s. Their study created a link between bank credit risk, size and ownership. According to Gizycki and Gizycki (2001) the impaired asset ratios of larger banks tend to be less than that of smaller banks. The study further revealed that foreign banks with small assets bases within Australia experienced particularly high levels of
impaired assets and low but variable profits between 1990 and 1992. To differentiate variation across banks and variation through time, a decomposition of the dispersion of the full panel data was carried out.

In other studies, Allen N Berger (1995) also argues that due to lower expected costs of bankruptcy, greater number of capitalized banks are able to attract higher earnings and that enabled them to pay lower interest on unsecured debt. Hortlund (2005) used data for Sweden for the period 1870 to 2001 and asserted that in the short run, successful banks could not only tend to be capitalized but also more profitable, which abstruse the fundamental positive relationship between leverage and returns.

2.3.2 Some Literature on Bank Credit Management Practices

A countable number of risk-adjusted performance measures proposals have existed (Heffernan, 1996; Kealhofer, 2003). However, the focus of these measures have been the risk-return trade-off, that is measuring inherent risk in each product or activity and accordingly charging it for the capital required in order to support it. This does not solve the problem of loanable amount recovery. In dealing with asymmetric information issues and also in reducing excessive loan loss levels, an effective system is critical to ensure repayment of loans by borrowers, and hence the long-term success of any banking organization (Baker & Mathews, 2009). Effective CR management involves establishing the Requisite CR environment; operating under a sound process of credit granting; maintaining an appropriate credit administration involving the monitoring process as well as sufficient controls over credit risk (Baker & Mathews, 2009; Van Greuning & Brajovic Bratanovic, 2003).

Bennardo et al. (2009) revealed that credit information sharing among surplus spending units and banks as individual deficit spending units reduce over-indebtedness, and this can be classified as
greatly indebted to receive less credit and ultimately diminish the over-indebtedness of borrowers. Luoto, McIntosh, and Wydick (2007) revealed that the employment of credit information sharing tend to shift or move client portfolio toward better performing clients, and the treatment of awareness induced a moderate improvement in repayment performance.

2.4 Overview of the Ghanaian banking system

The banking industry of Ghana comprises Bank of Ghana (BOG) as the regulating body. The number of banks in the industry has augmented from seven (7) in 1987 to twenty-eight (28) in 2015, and twenty three (23) currently. Most new entrants from the period of 1987 to 2010 were foreign banks (Adjei-Frimpong, Gan, & Hu, 2014). As at December 31st, 2016, the number of foreign-controlled banks was recorded to be 17 with 16 being locally owned (PWC, 2017).

Since the mid-1980s, the banking industry has undergone regulatory and structural changes (Alhassan & Ohene-Asare, 2013). In 1983, the government of Ghana, under the auspices of the IMF, introduced the Economic Recovery Program (ERP) as a remedy to the economic crisis the country was experiencing (Ohene-Asare & Asmild, 2012). In 1989, the Banking Law was enacted, and this enabled domestic incorporated bodies who were suitable to file applications for licenses to operate as banking institutions (Alhassan & Ohene-Asare, 2013). Later in 2004, the Banking Act 2004 (Act 673) replaced the Banking Law (Aboagye, Akoena, Antwi-asare, & Gockel, 2008).

Since 2002, there have been notable developments in the industry. These include Universal banking license ushered in 2003 which gave banks with GH¢7million in capital the opportunity to become versatile in providing services to their customers by undertaking all the banking activities unlike previously where they could only undertake the activities which they were specifically licensed to perform (Bokpin, 2013; Quartey & Afful-Mensah, 2014). Second is the enactment of the Banking Act 2004 (Act 673) under which the capital requirement of banks was required to
augment to $US 8 million which was later increased to $US 30 million and $US 60 million in 2012 and 2013 respectively (Alhassan, 2015; KPMG, 2012; PWC, 2014) and currently at $US 100, the equivalent of GHS 400 million. Another development was the abolishment of the secondary reserves requirement by BOG in 2006 in order to free up significant liquidity for lending to businesses (PWC, 2007). Following this development was the change of currency from the cedi to the Ghana cedi in July 2007 (BOG, 2007). Others were the Whistle Blowers Act 2006 (Act 720), the Foreign Exchange Act 2006 (Act 723), Banking (Amendment) Act 2007 (Act 738), Home Mortgage Finance Act 2008 (Act 770), Credit Reporting Act 2007 (Act 726), Borrowers and Lenders Act 2008 (Act 773), Non-Banking Financial Institutions Act 2008 (Act 774), Anti-money Laundering Act 2008 (Act 749) as well as significant mergers and acquisitions (Bokpin, 2013; Isshaq & Bokpin, 2012).

2.5 Chapter summary

This chapter talked about two aspects of literature, the theoretical and the empirical. The theoretical aspect hinges on relevant theories to this study. These are the information asymmetry and information sharing theories. The empirical literature focused on studies in relation to bank risk determinants and bank credit risk management practices. Lastly, this chapter gave a brief overview of the Ghanaian banking industry.
CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes how the research questions will be answered by the methods and processes used to collect and analyse the data. It basically answers the question “how do you intend to achieve the stated objectives of the research?” More closely, the chapter considers the sampling technique, the data source, the research design and the methods used in analysing the data.

3.2 Research Design

The quantitative approach is used in this study which allows for analysis of collected data using statistical procedures and hypothesis testing (Creswell, 2008). Generally, the quantitative research approach requires the determination of relationships between variables of a study using statistical techniques and hence the use of quantitative research approach in the study. A panel is adopted in this study as it suits the purpose of this study because of its character of requiring replications of the same units over time which allows for assessment of behavioural changes (such as profitability) over time (Wooldridge, 2013). In all, the study will gather and analyse data pertaining to listed banks in Ghana covering the period from 2010 to 2016 for the benefit of current information and ease of accessibility.

3.3 Sampling and sources of data

The population used for the study constitutes all listed banks in Ghana. The data sample consists of seven (7) listed banks that have been in continuous existence from 2010-2016. These banks are CAL Bank Limited, Ecobank Ghana Limited, Ghana Commercial Bank Ltd., HFC Bank Ltd, SG-
SSB Ltd., Standard Chartered Bank Ltd., and Republic Bank. Ecobank Transnational was excluded as its operations transcend the borders of Ghana. Likewise, ADB was excluded as it was recently listed.

Data is extracted from banks under consideration through their annual reports and cross-validated with similar data from the Banking Supervision Department of the Bank of Ghana. The choice of this data source is based on two main justifications. First, the annual reports are publicly available and second, these reports have been used by previous studies in the Ghanaian banking literature.

3.4 Profitability Analysis

Assessing the profitability of listed firms has received a lot of attention in literature. This may be attributed to the crucial role they play in economic growth and development. In addition, being able to assess a firm’s performance will help management identify various sources of inefficiency and subsequently improve future performance (Paradi & Zhu, 2013). Financial analysis or ratios have historically been employed in performance assessment of firms by regulatory agencies, researchers and management. A ratio is a quotient of two variables and was ideal because they are relatively simple and easy to understand. Return on Assets (ROA) will be used to measure performance of the selected listed companies.

3.4.1 Return on Assets (ROA)

For the purposes of this research, Return on assets is adopted to assess performance. Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets (Srivastava, Shervani, & Fahey, 1998). ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. Sometimes this is referred to as "return on investment" (Bernstein & Wild, 1998).
The formula for return on assets is:

\[ \text{ROA} = \frac{\text{Profit before Interest and Tax (PBIT)}}{\text{Average Total Assets}} \]  

(1)

3.5 Variable Measurements and Model Specification

A regression equation requires the choice of variables and justification thereof. In this study, the fundamental variables considered are liquidity and profitability. Though these variables are primarily related to the current study, the study incorporates other extra additional variables. Curwin, Roger and Slater (2008) suggest that in building a regression model, it is more practical to include more variables because it is easy to get around the problem of increased variance than the problem of biased prediction. Philips and Ghosh (2009) share a similar view arguing that the inclusion of more explanatory variables in a study help to improve model estimates and improves results of study. Hence, the model in this study incorporates other variables that potentially affect profitability of listed firms.

The main variable to be adopted for the second stage analysis is credit risk which will be measured by the ratio of non-performing loans to total credit (total loans and advances) and also the ratio of total credit to total deposits, but other external variables such as bank size, ownership structure, and leverage are also considered. A balanced panel regression model is adopted with return on Assets (ROA) as the response variable and the regressors include credit risk, size, ownership structure, and leverage. The model is estimated using a pooled OLS. The model is showed below:

Regression Model:

\[ \text{ROA}_{it} = \beta_0 + \beta_1 \text{CREDRISK}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{OWN}_{it} + \beta_4 \text{LEV}_{it} + \beta_5 \text{SG} + \beta_6 \text{COMP}_{it} + \beta_7 \text{RATES} + \mu_{it} \]  

(2)
Definition of Variables:

CREDRISK: Credit risk

SIZE: Bank Size

OWN: Ownership

LEV: Leverage

COMP: Competition

SG: Sales Growth

Rates: Interest rates

$\mu_{it}$ is a composite error term

3.5.1 Bank size

The size of the bank refers to the total assets of each bank over the period of 7 years. It is measured as the natural logarithm of the total assets of the sampled microfinance firms used in the study. It is an explanatory variable. This variable seeks to explain whether big banks enjoy certain economies of scale which causes them to be more dynamically efficient than smaller banks or whether smaller bank sizes is a pre-requisite for dynamic efficiency in the Ghanaian banking industry. Past studies in literature has documented ambiguous results. While some studies recorded a significantly positive impact of size on performance (Ataullah, Cockerill, & Le, 2004; Allen N. Berger, Hunter, & Timme, 1993; Perera, Skully, & Wickramanayake, 2007; Srairi, 2010), others found a significant negative impact (Allen & Rai, 1996; Altunbas, Carbo, Gardener, & Molyneux, 2007; Girardone, Molyneux, & Gardener, 2004; Isik & Hassan, 2002; Weill, 2004). Interestingly, other researchers like Avkiran (1999) and Allen N. Berger and Mester (1997) have found no
significant relationship in their study. In the Ghanaian banking industry, we expect to find a positive relationship between large banks and dynamic efficiency.

3.5.2 Ownership structure

Ownership structure is a dummy variable. The objective is to test for differences in profitability scores which could be attributed to the differences in bank ownership, i.e. between foreign owned banks and domestic banks. As already stated, a bank is ‘foreign’ if more than sixty (60%) of its equity share capital is held by foreigners and ‘domestic’ if otherwise. The impact of ownership structure has been largely studied in the literature and it has generally been found that foreign banks outperform domestic banks in developing economies while the opposite is the case for developed countries (A. N. Berger, Deyoung, Genay, & Udell, 2000; Bokpin, 2013; Claessens, Demirgüç-Kunt, & Huizinga, 2001; Deyoung & Nolle, 1996; Fries & Taci, 2005; Lensink, Meesters, & Naaborg, 2008). We therefore expect a positive coefficient for foreign banks.

3.5.3 Leverage

Leverage is measured as the ratio of total liabilities to total assets. It measures the proportion of banks assets funded by debt. On its impact on bank performance, a positive impact is expected. Carvallo and Kasman (2005) and Casu and Girardone (2006) have however found leverage to negatively impact bank efficiency.

3.5.4 Competition

HHI is employed in estimating competition in the Ghanaian banking industry. HHI estimates competition via market concentration measures (Boone, 2008; Schaeck & Cihák, 2014). HHI is computed as the sum of squares of each bank’s market share.
\[ HHI = \sum_{i=1}^{N} (MS_i)^2 \]  

(3)

Where MS represents the market share of bank i. The industry’s deposits, net advances and total assets are the criteria for computing a bank’s market share.

### 3.6 Data Analysis Technique

Data in the study will be analysed using both descriptive and inferential statistical analytical techniques. The descriptive statistics will comprise mean, kurtosis, and standard deviations. The descriptive statistics will help to ascertain properties of the variables under consideration in the study. The inferential statistics that will be used are correlation and regression. The technique of correlation will help to determine the direction of relationship between the dependent and the independent variables of the study. Regression technique on the other hand will help to determine the strength of association between the variables of the study. Data is mainly analysed using Excel, E-views 10, and R version 3.3
CHAPTER FOUR

DATA ANALYSES AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the results derived from analysing the data set for this study. First, it presents and analyses the descriptive statistics of the variable used in estimating the profitability of banks in Ghana. It then presents and provides preliminary analyses and discussions on the objectives of the study. The correlation matrix of both the effect and causal variables in the econometric model used in the study are discussed and shown. The general regression outputs are finally presented, and discussions based on the obtained results are made.

4.2 Description of data

Data used in this study was sourced from BOG and the annual reports of the banks. The data sample consists of 8 listed banks covering a 7-year period from 2010 to 2016 and giving 56 observations. Even though other listed banks existed prior to 2016, they were not included in the sample because the study adopts a balanced panel. Table 4.1 and 4.2 present summary and descriptive statistics of the variables used to carry out the analyses.

Evident from the Table 4.1, total assets and liabilities on average augmented over the seven (7) years period. But this increase has been almost in the same proportion, leading to an almost constant leverage ratio over the period. The minimum and maximum values of the variables, particularly that of total assets and their relatively high dispersion, measured by the standard deviations also leads to a very important revelation and conclusion that banks in Ghana have different sizes and justifies that there exists variable returns to scale in the banking industry.
Table 4.1 Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets</td>
<td>8</td>
<td>984.32</td>
<td>823.53</td>
<td>280.09</td>
<td>1015.46</td>
</tr>
<tr>
<td>Total liabs</td>
<td>8</td>
<td>865.44</td>
<td>633.41</td>
<td>110.11</td>
<td>190.27</td>
</tr>
<tr>
<td>Loans &amp; Adv</td>
<td>8</td>
<td>713.24</td>
<td>130.16</td>
<td>250.39</td>
<td>900.26</td>
</tr>
<tr>
<td>Cred Risk</td>
<td>8</td>
<td>-1.03</td>
<td>0.60</td>
<td>-2.38</td>
<td>-0.51</td>
</tr>
<tr>
<td>Lev</td>
<td>8</td>
<td>0.84</td>
<td>0.11</td>
<td>0.56</td>
<td>0.92</td>
</tr>
<tr>
<td>Size</td>
<td>8</td>
<td>20.46</td>
<td>0.82</td>
<td>19.10</td>
<td>21.45</td>
</tr>
</tbody>
</table>

We could tell from the table that total assets and liabilities on average increased over the study period. But this increase has been almost in the same proportion, leading to an almost constant leverage ratio over the period.

The minimum and maximum values of the variables, particularly that of total assets and their relatively high dispersion, measured by the standard deviations also leads to a very important revelation and conclusion that banks in Ghana have different sizes and justifies that there exists variable returns to scale in the banking industry.

4.3 Profitability of Listed Banks

To address the second objective of this study, the profitability of each selected bank is assessed by computing the Return on Assets for the seven (7)-year period. The scores presented are an average of all the seven (7) years. This is calculated by dividing a bank's annual earnings, that is Profit before interest and tax (PBIT) by its total assets, and the results displayed in a percentage decimals. ROA is preferred for performance measurement, because unlike other ratios of profitability including return ROE, the former measurement includes all of the assets of the bank— even those that arise out of liabilities to creditors as well as those that emanate from investor’s contributions,
hence seen to be a more essential and robust internal tool for performance measurement (Burton, Lauridsen, & Obel, 2002).

The formula for ROA is:

\[
\text{Return on Assets} = \frac{\text{Pre-Tax Profit}}{\text{Total Assets}}
\]

The results are presented in table 4.2 below but full details of the variables used in the computation are given in the appendix:

<table>
<thead>
<tr>
<th>BANKS</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCB</td>
<td>0.04</td>
<td>0.01</td>
<td>0.06</td>
<td>0.09</td>
<td>0.09</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
</tr>
<tr>
<td>SCB</td>
<td>0.06</td>
<td>0.06</td>
<td>0.07</td>
<td>0.09</td>
<td>0.08</td>
<td>0.03</td>
<td>0.08</td>
<td>0.07</td>
</tr>
<tr>
<td>ADB</td>
<td>0.04</td>
<td>0.04</td>
<td>0.02</td>
<td>0.05</td>
<td>0.02</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>SG-SSB</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.03</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>ECOBANK</td>
<td>0.06</td>
<td>0.05</td>
<td>0.06</td>
<td>0.06</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>CAL</td>
<td>0.02</td>
<td>0.03</td>
<td>0.06</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>HFC</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.05</td>
<td>0.05</td>
<td>0.02</td>
<td>-0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>ACCESS</td>
<td>0.06</td>
<td>0.05</td>
<td>0.06</td>
<td>0.07</td>
<td>0.07</td>
<td>0.05</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Mean</td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
<td>0.07</td>
<td>0.06</td>
<td>0.05</td>
<td>0.03</td>
<td></td>
</tr>
</tbody>
</table>

From the table, we could tell that even though there have been a few irregularities over the years for some of the banks, the ROA of most of the banks on the average has increased over time (2011, 2015 and 2016 are exceptions to this). An explanation for this could be that liquid assets, total assets, shareholder’s fund and total comprehensive income have on average augmented over the years.
We could also tell from the figure that when we take the means of the Returns, we could say that Standard Chartered Bank (SCB) is the high performing bank in the industry with the highest ROA of 0.064 over the years considered.

4.4 Correlation Analysis

The table and the correlation matrix below will give us other insights on how capital structure and other variables might have influenced the behavior of the Return on Assets (ROA) by considering their relationship with it.
Table 4.3 (Correlation Matrix)

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>CREDRISK</th>
<th>OWN</th>
<th>SIZE</th>
<th>LEV</th>
<th>SG</th>
<th>Rates</th>
<th>HHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CREDRISK</td>
<td>-0.63</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OWN</td>
<td>0.47</td>
<td>-0.43</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>0.64</td>
<td>-0.10</td>
<td>0.10</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>0.13</td>
<td>0.46</td>
<td>-0.31</td>
<td>0.77</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG</td>
<td>0.42</td>
<td>-0.66</td>
<td>0.30</td>
<td>0.29</td>
<td>-0.25</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RATES</td>
<td>0.09</td>
<td>0.14</td>
<td>0.00</td>
<td>-0.05</td>
<td>-0.61</td>
<td>0.44</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>HHI</td>
<td>-0.42</td>
<td>-0.66</td>
<td>0.30</td>
<td>-0.33</td>
<td>-0.61</td>
<td>-0.23</td>
<td>-0.30</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: ROA is return on asset and is computed as pre-tax profit divided by total assets. CREDRISK is credit risk and it represents the ratio of non-performing loans to total credit (total loans and advances) and also the ratio of total credit to total deposits, OWN is ownership, as to whether the bank is foreign or domestic, SIZE stands for Bank size which is measured by a natural log of total assets, LEV is for leverage which is measured as the ratio of total liabilities to total assets. HHI is a measure of competition.

The correlation matrix spells out various relationships that other variables have with ROA and themselves. The matrix reveals that size forms the highest correlation with outcome variable, ROA. The pair recorded the highest correlation coefficient of approximately 0.64, which shows a positive relationship between the two. We could confirm that from the table that as size increases, ROA increases likewise and as size decreases, ROA most often decreases as well. All the other variables also form a positive relationship with ROA with the exception of credit risk, which recorded the second highest relationship with ROA.

The positive relationship between ROA and ownership structure buttresses the point that foreign banks outperform domestic banks in developing countries. This results provides support for the global advantage hypothesis and is similar to the findings of Fries and Taci (2005) on 289 banks in 15 post-communist countries and Bokpin (2013) on the Ghanaian banking industry. Possible explanation of this finding is that these foreign banks have successfully been able to transfer their
expertise and knowledge from their home countries and are exploiting local opportunities to perform better than the domestic banks.

4.4 Regression Analyses

To achieve the second and third objectives of this study, the effect of credit risk and other variables on banks profitability, measured by ROA, is assessed. Variables such as ownership, size, leverage, sales growth, competition and interest rates are considered as control variables. Before conducting this analysis however, a test is first performed to test for possible multicollinearity problems among the regressors. Generally, there is low correlation among the independent variables.

The fitness of the regression model used for this analysis is tested and some of the results are seen in the Regression statistics below. The coefficient of determination is used to test the model fitness. Statistically the closer the coefficient of determination (R2) value is to 100%, the stronger the regression model and its reliability. From the regression table 4.4 below, the R squared of 0.76 (76%) confirms the fitness and reliability of the regression model used.
Table 4.4 Regression Results

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.45</td>
<td>0.33</td>
<td>-1.36</td>
<td>0.03</td>
</tr>
<tr>
<td>CREDRISK</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.52</td>
<td>0.02</td>
</tr>
<tr>
<td>OWN</td>
<td>0.01</td>
<td>0.02</td>
<td>0.25</td>
<td>0.06</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.04</td>
<td>0.04</td>
<td>1.07</td>
<td>0.40</td>
</tr>
<tr>
<td>HHI</td>
<td>-1.20</td>
<td>0.51</td>
<td>-2.34</td>
<td>0.02</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.42</td>
<td>0.57</td>
<td>-0.73</td>
<td>0.05</td>
</tr>
<tr>
<td>RATES</td>
<td>0.01</td>
<td>0.10</td>
<td>0.10</td>
<td>0.63</td>
</tr>
<tr>
<td>SG</td>
<td>-0.01</td>
<td>0.00</td>
<td>-0.96</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Regression Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple R</td>
<td>0.87</td>
</tr>
<tr>
<td>R Square</td>
<td>0.76</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>0.17</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.02</td>
</tr>
<tr>
<td>Observations</td>
<td>8</td>
</tr>
</tbody>
</table>

4.4.1 Credit risk and Profitability

The regression result reveals a negative impact of credit risk on profitability. The coefficient of -0.02 means that a unit increase in the credit risk of banks will lead to a 0.02 units decrease in the return on assets, thus profitability.

4.4.2 Ownership and Profitability

Ownership has a positive effect on performance of listed banks in Ghana, which confirms the positive effect indicated by some previous studies reviewed in the second chapter. The coefficient of the variable suggests that all things being equal, ROA is expected to be approximately 0.01 units more if the listed bank is a foreign bank than domestic. The positive impact of ownership on profitability buttresses the point that foreign banks outperform domestic banks in developing countries. This results provides support for the global advantage hypothesis and is similar to the findings of Fries and Tací (2005) on 289 banks in 15 post-communist countries and Bokpin (2013)
on the Ghanaian banking industry. Possible explanation of this finding is that these foreign banks have successfully been able to transfer their expertise and knowledge from their home countries and are exploiting local opportunities to perform better than the domestic banks.

4.4.3 Size, Leverage and profitability

The regression output suggests a positive impact of bank’s size on performance, but insignificant at 5%. The positive relationship implies that larger banks perform better over time than smaller banks, and also a unit increase in the size of a bank will lead to a 3.83 percent increase in the return on assets of the bank. Leverage recorded a higher impact of -0.4

4.4.4 Competition and Performance

The impact of industrial competition (measured by the HHI) on the performance of banks is also shown in the regression output. The results show a significant negative relationship between competition and profitability. The negative relationship implies that a less competitive banking industry will cause banks to perform poorly over time. In other words, the lower the competition, the more likely it is to record a lower performance. This may be because reduced competition may introduce less efficiency in banks operations, risk management behavior and laxed customer services, these could lead to a rise in risk that affects cost of operations and overall management of the bank, which will ultimately impact performance. The findings have significant implications for bank regulators in drafting and implementing competition policies.

4.4.5 Interest rates and Profitability

With respect to interest rates, the regression results reveal a positive impact of on ROA, but it insignificant, suggesting interest rates is not an important factor regarding profitability of listed banks, which is rather against a priori expectation, since banks returns hinges on interest rates
margins that they are able to obtain in the market, which should have an influence on their performance.

4.5 Summary

The chapter presented the results derived from analysing the data set for this study. First, it presented and analysed the descriptive statistics of the variables used in estimating the profitability of banks in Ghana. It then presented and provided preliminary analyses and discussions on the objectives of the study. The correlation matrix of both the effect and causal variables in the econometric model used in the study were discussed and shown. The general regression outputs were finally presented, and discussions based on the obtained results were made.
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter has been divided into two sub-sections. The first subsection highlights the objectives of the study, the methods used in addressing the objectives, findings and conclusions. In the following subsection, recommendations for policy and practice are provided as well as directions for further research.

5.2 Summary of the study

The central objective of this research is to assess the relationship between credit risk and the profitability of listed banks in Ghana. Return on Assets (ROA) was employed as a measure of profitability and the impact of credit risk, ownership, bank size, leverage, sales growth, competition and interest rates was assessed.

Credit risk was measured by the natural log of the ratio of loans to total asset of bank i in year t. Ownership was considered a dummy variable. The objective was to test for differences in profitability scores which could be attributed to the differences in bank ownership, i.e. between foreign owned banks and domestic banks. Size was measured as the natural logarithm of total assets. This variable sought to explain whether big banks enjoy certain economies of scale which causes them to be more dynamically profitable than smaller banks or whether smaller bank sizes is a pre-requisite for performance in the Ghanaian banking industry. Leverage was measured as the ratio of total liabilities to total assets. It measured the proportion of banks assets funded by debt. HHI was employed in estimating competition in the Ghanaian banking industry. HHI estimated competition via market concentration measures.
The data source for this study was the annual reports of all eight (8) listed banks for a seven year period beginning from 2010 to 2016. The study’s population constitutes all listed banks operating in Ghana. The choice of this data source was based on two main justifications. First, the annual reports are publicly available and second, these reports have been used by previous studies in the Ghanaian banking literature. The major findings of this study are summarised below.

5.3 Summary of Findings

Even though there have been a few irregularities over the years for some of the banks, on the average, the ROA of most of the banks have increased over time. An explanation for this could be that liquid assets, total assets, shareholder’s fund and total comprehensive income have on average augmented over the years.

Standard Chartered Bank (SCB) was the high performing bank in the industry with the highest ROA of 0.064 over the years considered.

A positive linear relationship between all other determinants considered and performance were spelt out. Only credit risk and rates recorded negative relationships. Size formed the highest correlation with ROA, followed by ownership, sales growth, competition and leverage in that order.

The regression result revealed a negative impact of credit risk on profitability. A unit increase in the credit risk of banks will lead to a 0.02 units decrease in the return on assets, thus profitability.
Ownership had a significant positive effect on performance of listed banks in Ghana, which buttressed the point that foreign banks outperform domestic banks in developing countries. A Possible explanation for this is that these foreign banks have successfully been able to transfer their expertise and knowledge from their home countries and are exploiting local opportunities to perform better than the domestic banks.

There was also a positive impact of bank’s size on performance, but insignificant at 5%. The positive relationship implied that imply that larger banks perform better over time than smaller banks, and also a unit increase in the size of a bank will lead to a 5.13 percent increase in the return on assets of the bank. Unlike size, leverage reported a negative impact on banks profitability, which implies that highly levered banks have low profitability rates.

Competition also recorded a significant negative impact on profitability. The negative relationship implies that a less competitive banking industry will cause banks to perform poorly over time. In other words, the lower the competition, the more likely it is to record a lower performance. This may be because reduced competition may introduce less efficiency in banks operations, risk management behaviour and laxed customer services, these could lead to a rise in risk that affects cost of operations and overall management of the bank, which will ultimately impact performance.

5.4 Recommendations

The findings and the conclusions of this study provide important implications for policy, practice and further research.

For Practice and Policy,

a. ROA of most of the banks seems to have increased slightly over time, but not that highly improved. To bring about significant improvements, it is incumbent on
policy makers and management to enact policies and practices to minimize the wastages in order to improve the current level. Reduction of operating expenses and sound risk management procedures can be undertaken to achieve such objectives.
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