

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
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**Assessing the Effect of Financial Sector Reform Measures on Bank Performance
in the Ghana Bank Industry**

By

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DECLARATION

I hereby declare that this submission is my own work towards the award of MSc. Industrial Finance and Investment and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

To my wife, Mrs Irene Jampat

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I first of all thank the Almighty God for keeping me in good health and giving me the knowledge and wisdom to go through this programme. I also thank my supervisor, Mr Mohammed Kamal-dean, for his fatherly guidance, patience and constructive criticism throughout supervision of this thesis. And to my parents, Mr and Mrs Jampat Pangben, and to all my friends, especially Mr and Mrs Frimpong Arthur and Esq. Stephen Sabunam Kansuk who contributed through motivating me each time I was down. Finally, to all whose names have not been mentioned, I appreciate your efforts. God bless you all.



ABSTRACT

The Ghana bank-based financial industry has had its intermittent turns over the past due to the deplorable conditions under which these banks operated. This study therefore was launched to assess the effect of these bank sector reform measures and how they affect bank performance in the areas of bank size, liquidity risk and credit risk. A descriptive design was used to aid in collecting secondary data between 2008 and 2016 from nine (9) banks. Having analysed data using both the fixed and random effects models in collaboration with the Hausman, it was established that the independent variables used produced mixed results in their relationship with bank performance. Whilst bank size and credit risk had a statistically significant positive relationship with Return on Assets, liquidity risk was also found to positively relate with bank performance under Return on Equity. In another development, bank size and credit risk had an inverse relationship with bank performance proxied by Return on Equity. Following these revelations, the study concludes that the behaviour of a particular variable on the dependent variable is dependent on management policy implementation and execution. Since the regressor variables behave differently under different conditions, management should come to terms with the reality that all regressor variables play important roles in determining bank profitability and so by this observation all bank level variables must be taken seriously to stabilise the bank since they behave differently under different profitability measures. The study offers the following recommendations; Management should open more branches to take advantage of reduced per unit cost of operations but should be cautiously; Banks should generally have a threshold for lending out funds to customers.

TABLE OF CONTENT

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
LIST OF TABLES	vii
LIST OF FIGURES	viii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background to the Study	1
1.2 Statement of the Problem	5
1.3 Objectives of the Study	7
1.4 Research Questions	7
1.5 Significance of the Study	7
1.6 Scope of the Study	9
1.7 Limitation of the Study	9
1.8 Organisation of the Study	9
CHAPTER TWO	11
LITERATURE REVIEW	11
2.1 Introduction	11
2.2 Financial Reform	11
2.2.1 Brief Overview of Financial Sector Measures in Africa	12
2.2.2 Brief Overview of Reform Measures in Nigeria	13
2.2.3 Brief Overview of Reform Measures in Kenya	13

2.2.4	Overview of Ghana’s Financial Sector	14
a.	The Banking Sector	14
b.	The Insurance Sector	16
c.	The Capital Market	17
2.3	Concepts	18
2.3.1	Financial Sector	18
2.3.2	Bank Performance	19
2.3.3	Bank Size	19
2.3.4	Bank Credit Risk	20
2.3.5	Liquidity Risk	21
2.4	Theories Underpinning the Study	22
2.4.1	Financial Intermediary Theory	22
2.4.2	The Money Creation Theory	24
2.5	Empirical Review	26
2.5.1	Effect of Bank Size on Bank Profitability	26
2.5.2	Effect of Credit Risk on Bank Profitability	28
2.5.3	Effect of Liquidity Risk on Bank Profitability	30
2.6	Conceptual Framework	35
CHAPTER THREE		36
METHODOLOGY		36
3.1	Introduction	36
3.2	Research Design	36
3.3	Target Population of the Study	36
3.4	Sample and Sampling Techniques	37

3.5	Data Type	37
3.6	Diagnostic Test	37
3.6.1	Hausman Test.....	37
3.6.2	Fixed and Random Effects Models	38
3.7	Econometric Specification	39
3.8	Study Variables	40
3.8.1	Variable Definitions	41
3.9	Data Analysis Technique	41
CHAPTER FOUR		43
RESULTS AND DISCUSSION		43
4.1	Introduction	43
4.2	Descriptive Statistics	43
4.3	Correlation Matrix	45
4.4	Multi-Regression Analysis	47
4.4.1	Hausman Test (Model I-ROA)	48
4.4.2	Panel Regression Results: ROA as Dependent Variable	49
4.4.3	Panel Regression Results: ROE as Dependent Variable	54
4.4.4	Hausman Test (Model II-ROE)	54
CHAPTER FIVE		60
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....		60
5.1	Introduction	60
5.2	Summary	60
5.3	Major Findings	61
5.3.1	Effect of Bank Size on Bank Profitability	61
5.3.2	Effect of Credit Risk on Bank Profitability	61

5.3.3 Effect of Bank Liquidity Risk on Bank Profitability61

5.4 Conclusion62

5.5 Recommendations63

REFERENCES64

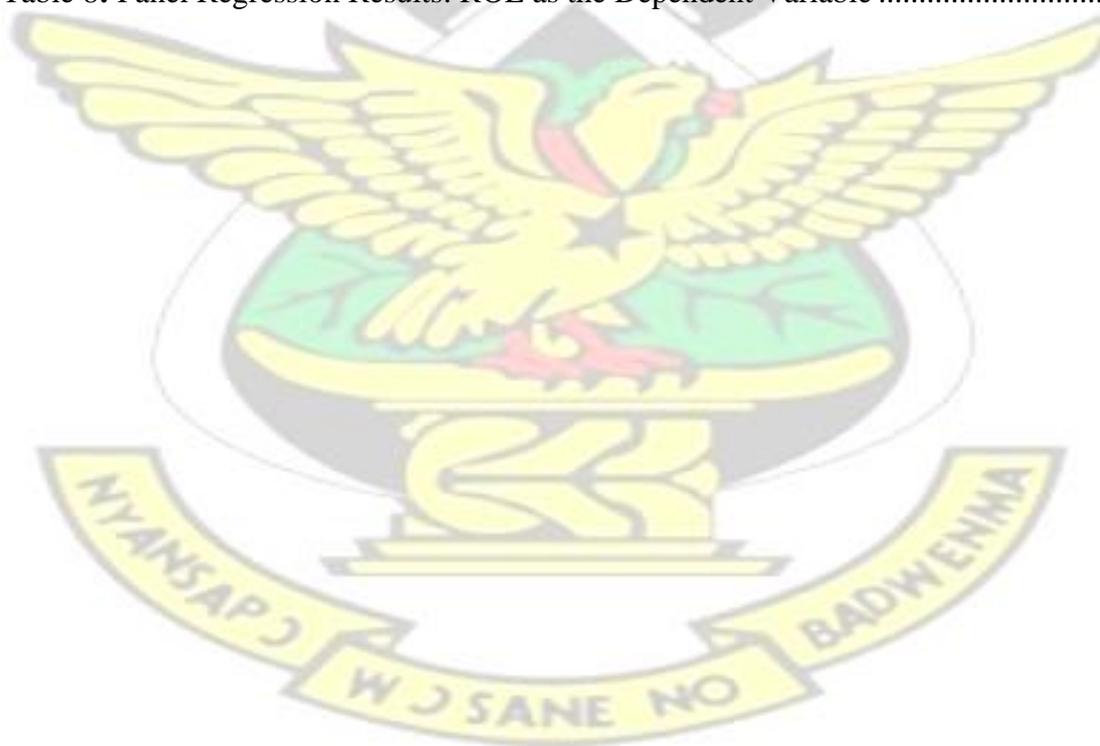
APPENDICES71

KNUST



LIST OF TABLES

Table 1: New and Previous Minimum Capital Requirements (MCR) for Different Insurance Regulated Entities.....	17
Table 2: Variable, definitions and notations.....	41
Table 3: Descriptive Statistics	44
Table 4: Correlation Matrix	46
Table 5: Hausman Test (Model I for ROA).....	48
Table 6: Panel Regression Results: ROA as the Dependent Variable	49
Table 7: Hausman Test (Model II for ROE).....	54
Table 8: Panel Regression Results: ROE as the Dependent Variable	55



LIST OF FIGURES

Figure 1: Dependent and independent variables35

KNUST



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Being central to the economic development of most countries across the globe, the financial sector plays an intermediary role in mobilising savings and allocating credit for productive investments (Hasan, Khan & Ali, 1996). This makes it important for the sector to be regulated and monitored to ensuring that it is put on a sound footing. Financial sector reforms are therefore undertaken to increase the efficiency of the financial markets. This explains why the financial sector reform in the 80s and early 90s was an integral component of the structural adjustment programmes carried out by developing economies (Peart, 1995). According to NeoStencil (2019) “*financial sector refers to the part of the economy which consists of firms and institutions that have the responsibility to provide financial services to the customers of the commercial and retail segments. The financial sector can include commercial banks, non-banking financial companies, investment funds, money market, insurance and pension companies, and real estate etc*”. Being central to this study, financial sector reform measures are basically policy initiatives undertaken by the sector regulatory authorities to sanitise all sector components such as the bank sector, insurance, pension houses, security and capital markets and the foreign exchange market among others.

Sectoral reform measures in the global financial economy are not new and require extensive and complex processes with sustained commitment to execute. These financial sector policy initiatives arise basically because of the fragile nature of the industry coupled with the urge for excessive control by the central banks (Gelb, & Honohan, 1989). In many countries, the financial system is inundated with deposit money banks making it mandatory for institutions to be enriched with a wide range of services to customers, as such the need sometimes for policy reforms (Gelb, & Honohan, 1989). Available evidence however suggests that most financial sector reforms have fallen on hard times especially in the global bank sector (World Bank, 1998). For instance, only 12 out of 23 sampled countries in 2007 appeared not to have had challenges with institutional policy measures (World Bank, 2008).

An efficient financial sector is necessary for the mobilization of household savings and to ensure their proper utilisation in productive sectors. A sound financial system is panacea for economic growth and development, as it helps alleviate poverty and boosts shared property. This core function of every financial system makes it crucial for the regulatory authorities of every country to monitor and supervise the activities of the players in that industry. Whilst many countries have undertaken this exercise repeatedly, others have pursued them consistently for a long period of time, with some rolling out the exercise intermittently, often hurriedly and within a short time period (Lee, 2017). One thing however stands tall; enhancement of efficiency and strengthening the stability of the financial system.

On the global financial reform platform, Japan has an interesting case. Yes, undoubted Japan is an advanced country, yet, it has a checked history of market distress since the late 1980s (Lee, 2017). Having endured the financial system crisis for nearly 20 years, Japan now has a relatively functional financial system, especially their bank sector (Lee, 2017). Singapore and Hong Long have had a rapid and concurrent financial market growth, as they boast of world-class financial centres having suffered the financial turmoil in the past (Lee, 2017). Although their financial sectors lagged slight development, China and Malaysia have similarly experienced a swift growth in the real sector. Due to strict control and protection, Indonesia, South Korea and Thailand have equally had a high-speed growth. These notwithstanding, Indonesia, South Korea and Thailand have remained retarded because of the excessiveness in supervision and controls.

African countries have had their share of the contagion. This is especially true of countries in Sub-Saharan Africa where the industry underwent extensive financial sector policy improvement. Elsewhere in our own backyard, 21 banks were closed down by the Central Bank of Nigeria (CBN) between 1930 and 1958 owing to leverage issues and high risk taking resulting from debt to asset and equity challenges (CBN Bulletin 2010, cited in Matey, 2019). The Dubia Bank, Imperial Bank and the Chase Bank all in Kenya were closed down for several reasons of liquidity, non-performing loans and capital deficiency challenges (Taboi, 2017). In Ghana for instance, most affected banks during the 2017 bank sector clean up were found to have exceeded the regulatory single obligor limit. The governor of Bank of Ghana revealed that UT Bank exceeded its single obligor limit of GH¢20m when it

advanced a loan of GH¢300m to a politically exposed customer (Nyalatorgbi 2019, cited in Matey, 2019).

When issues arise this way, they are usually met with extraordinary interventions which could be administrative or judicial. It is however worrying that equity holders and managers of affected banks hold differing views, as bank owners tend to do everything to avoid the imposition of extraordinary measures to arrest the situation (Schooner, & Michael, 2010). After the crises, it came to light that, before liquidity support was provided, banks never provided collateral and that these funds were eventually misapplied (Nyalatorgbi, 2019). The governor of BoG discovered that Uni-Bank loaned out to Belstar Capital Ltd an undisclosed colossal sum to acquire shares in Agricultural Development Bank.

The test on bank lending activities is incorporated in this study to throw light on how the financial sector reform measures can influence bank performance. These considerations draw closer theories that are distinct and mutually exclusive and have dominated recent bank and finance research literature (Werner, 2016). The money creation theory of banking happens to be the oldest, and maintains that banks can individually create money out of nothing through accounting practices in the form of loans to customers (Werner, 2016). Over creation of money could engineer bank distress and destabilisation of the macroeconomy. Therefore, it is prudent that the central regulatory body come in to compel compliance. Besides, the financial intermediation theory is another dominant theory that holds that banks create liquidity by borrowing short and lending long to customers (Dewatripont, Rochet, & Tirole, 2010, cited in Werner, 2015). This activity of banks makes them vulnerable to crisis since they borrow for short and in turn lend out on long term basis. The regulatory

body needs to come in here to enforce appropriate lending rudiments. Other equally relevant theories linked to bank performance will be accorded credence under the literature review section of the study.

1.2 Statement of the Problem

As with most industrialised economies, engagement in extensive expansion of bank branches and operations without due diligence have been blamed by many stakeholders in the financial sector for bank failure (Adusei, 2015). Plethora of studies argues that the global financial crisis was partly due to larger bank size (Adusei, 2015). In his opinion, Aladwan (2015) thinks that if the bank size is not regulated, disproportionate growth could make it difficult for banks to engage in economically viable liquid investments, and indeed lead to diseconomies of scale. Larger sized banks are linked to decreasing profits in certain scenarios (Kosmidou, 2008). This assertion has the support of the agency theory that presupposes that managers only work to grow the firm for their selfish benefits and not for the interest of shareholder (Jensen, & Meckling, 1976). These debates have left aspiring researchers with no option than to equally stage studies to assess bank size-profitability relationship.

The bank system is exposed to high risk that has the potential to compromise its solvency. The credit creation function of most of the banks is nothing good to write home about, deterring potential investors from risking their investments. And indeed it serves as a drain to the profits of these banks. A higher Debt-to-Equity-Ratio is a panacea for insolvency and exposure to failure. Debt-to-Equity-Ratio considers external claims against the bank in relation to its shareholder equity. An estimated 70-90 percent of banks' assets is tied to loans and advances (Matey, 2019). No strategic investor in his or her right sense will venture into firms with higher DER, because

their funds will only be used to settle indebtedness. Once the activities of the bank are disrupted due to over lending and failure to pay loans, the banking system charged with the responsibility of providing the framework for economic transaction will equally suffer setbacks. This is why the bank sector needs to be regulated in every economy to cater for externalities like these (Ekinci, & Poyraz, 2019). One of the anchors of this study was to establish the relationship between risk and bank performance and, owing to the challenges and revelations above; there is a level ground for the researcher to proceed with this study.

Liquidity risk arises when the bank management expresses fear of their inability to settle maturing indebtedness. When it occurs this way, the legal implication is that such a firm is in default (Nikolaou, & Drehmann, 2010). One of the most revered reforms of the Basel Committee on Banking Supervision [BCBS] (2013) is the maintenance of Liquid Coverage Ratio (LCR) as a promotion for short-term resilience of the liquidity risk profile of banks globally. This regulatory demand was also to ensure the maintenance of an optimum stock of unencumbered high-quality liquid assets easily convertible into cash without losing their value to meet daily financial obligations for at least 30 days. Liquidity risk has therefore been one problem that most banks face. Whilst a section of stakeholders in the bank industry advocates for higher liquidity maintenance (Curak, Poposki, & Pepur, 2012), others think holding on to higher liquid assets deprives the bank of higher rates of returns on investment (Adusei, 2015). This unsettled position on whether to maintain higher or lower liquid assets has supported the researcher's bid study into how liquidity risk affects bank performance. Based on the advanced arguments on bank size, credit risk and liquidity risk, this study assesses the financial sector reform measures and how they affect bank performance, proxied by profitability.

1.3 Objective of the Study

The goal of the study was to assess the effect financial sector reform measures have on bank performance in the Ghana Bank Industry. This larger objective was achieved pursuant to the following specific objectives;

- i. To determine the effect of bank size on bank performance
- ii. To establish the relationship between credit risk and bank performance
- iii. To evaluate the effect of liquidity risk on bank performance

1.4 Research Questions

- i. What effect has bank size on bank performance?
- ii. What is the relationship between bank credit risk and bank performance?
- iii. How does bank liquidity affect bank performance?

1.5 Significance of the Study

The unsettled arguments raised by past studies about financial reform and its effect on bank performance point to the need for further research as mentioned in the problem statement. Results obtained in this study will be beneficial to management of banks in the Ghana bank industry on how relevant institutional policies are to the very survival of the banking institution. Thus, findings will be used as a benchmark to regularise their operations. Not only will findings benefit bank management, it will help policy-makers to redesign their policy frame reminiscent of past results from sector reforms. Bank management will rely on some reform measures to know where they do well and where they poorly perform so they could stage a total sanitisation of their trend of operations. Bank regulators and other interest groups such as the banker associations,

capital markets etc, will use findings of this study as a gauge of bank performance so as to concentrate on sectors and areas that need serious considerations.

In relation to research specific objectives, individual banks will come to terms with the need to cautiously expand their operations to maximise returns on investment. Besides, banks will be made aware of the relevance of the single obligor policy. This will help them stay away from engaging in excessive disbursement of loans to customers who may eventually default, thereby exposing banks to bankruptcy. The amount of liquid assets to maintain by a bank is very important in protecting the bank from its obligatory functions to customers and also to loss of returns on interest earning investments. Whichever is applicable in a particular bank's situation could be adopted.

Aspiring researchers on bank and finance related topics could find this piece a valuable asset and as a reference point. Potential investors and shareowners will know how their funds and investments are applied and protected. Thus, equity holders will seek to know how their investments are protected from loss by regulatory bodies. Also, investors will find it a plane ground to decide if they should continue with their investments or redeem their shareholding rights.

1.6 Scope of the Study

Situating this current study in the just past bank sector cleanup (2017), three areas are deemed relevant, although other auxiliary areas are unavoidable. The study is confined to bank size, credit risk issues and liquidity maintenance management considerations. This will help determine whether the reforms positively affected bank performance or otherwise. Besides, data collection is limited to 2008-2016 (9 years).

1.7 Limitation of the Study

Secondary data were used through download from websites of the selected banks. As the case sometimes may be, secondary data in the form financials could be decorated and window dressed. Some banks engage in massaging accounts figures to portray their institutions positively to the investor public. Data were quite limited to a particular time frame due to the study's objective of targeting the immediate past bank sector reform (2017). As such, the number of years was limited with limited number banks.

1.8 Organisation of the Study

This study is structured into five sections; chapter one entails introduction to the study which comprises background to the study, statement of the problem, research objectives and research questions. The rest under this section are significance of the study, scope and limitation. Review of related literature on the study is done in chapter two. Concepts, theories of banking and their perspectives, empirical and conceptual framework are the sub-headings that are looked at in this literature section. Chapter three deals with research methodology; it considers the processes and procedures adopted by the researcher to gather needed data. The research design,

population of the study, sample and sampling technique, data type and the model specification are the main issues dealt with. Model specification and tools for data analysis ends this section. Section four, which is the results and discussion chapter, analysis and interprets results. It also discusses results and the implications for policy and practice. Closing comments are recorded in chapter five. They include summary, conclusion and recommendations.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section of the study typically deals with a number of relevant issues to the topic under consideration. Concepts commonly used in bank sector reforms and how they affect bank performance, overview of Ghana's Financial Sector and also theories that underpin this current study are among topics considered under this section. Empirical studies across the globe and conceptual framework that situates the research are also considered.

2.2 Financial Reform

This refers to policy initiative adopted by countries to sanitise or bring positive changes to the bank industry, capital markets, foreign exchange market etc. This exercise is usually carried out by the regulator of the financial sector (the BoG in the case of Ghana) to regularise operations and to make sure the sector one capable of withstanding external shocks. The liberalisation of the bank sector especially, included the relaxation of interest rate controls, enforcement of the single obligor policy, partial privatisation of government own banks and restructuring of the bank industry among others (Owusu-Antwi, & Southeastern, 2009). One fundamental reason for the bank sector reform is to enforce required laws by the BoG through compelling banks and other component institutions to abide by ethical banking and financial standards (Anokye, 2019). At least we have had experiences on these reform measures from the collapse banks. At least if for nothing at all from the exercise, we equity owners of various affected institutions who are now aware their activities are being watched and monitored for compliance. In the past, we had situations where

management of banks dips into depositors funds for the advancement of their own interest as partly supported by the agency theory. The excesses in the financial institutions where fraudulent banks promise exorbitant interest rates to woe unsuspecting and the greedy public for their deposits where at the end owners of these institutions operate on a pyramid system for only a few to benefit (Anokye, 2019).

2.2.1 Brief Overview of Financial Sector Reform Measures in Africa

The seminal works of McKinnon (1973) and Shaw (1973) heightened the adverse effects of reforms in the financial sector on general economic development of certain countries. *“Financial repression refers to the distortion of domestic financial markets through measures such as ceilings on interest rates and credit expansion, selective allocation of credit, and high reserve requirements”* (Ikhide, & Alawode, 2001, p. 3). In fact, the work of Ikhide, and Alawode (2001) appears to dwell on the negatives of financial sector reform measures, as they lambast the misguided nature of policies that have damaged economies of most countries, especially in Africa. This they say; policies undertaken to restructure economies have tended to reduce savings and encourage investments in inefficient ventures and unproductive activities. Ikhide, and Alawode (2001) feel that the ideal reform exercise should rather aim at removing interest rates and credit ceiling, halting of selective credit allocation by reducing reserve requirements. The said recommendation on how best to execute financial sector reforms have had differing results across the African soil depending on the mode of implementation. Whilst in some countries the reform measures have yielded positive results (Fry, 1978; De Melo, 1986; Khatkhate, 1988), has far reaching grave repercussions on certain economies (Diaz-Alejandro, 1985; Corbo, & De Melo, 1986). Economies in the latter group suffered considerable macroeconomic

instability, colossal capital flight and widespread bank failures due to financial liberalisation (Ikhide, & Alawode, 2001).

2.2.2 Brief Overview of Reform Measures in Nigeria

Any such discussion that bothers of financial sector reform measures will amount to a half-discussion if a mention is escaped of the Nigerian economy due to its size and role it plays in the African entire economy. In fact, anecdotal reports on financial liberalisation programmes in Nigeria show that it started in 1986 with the setting up of a second-tier foreign exchange market (Ikhide, & Alawode, 2001). As one of its reform measures, Nigeria restored the appropriate foreign exchange rates and corrected the over-valuation of the domestic currency by auctioning the foreign exchange to licences dealers ((Ikhide, & Alawode, 2001). In the following year, efforts were made by the regulatory body of the sector to allow banks the power to engage in a range of assets and liabilities they could acquire. Holding stocks in non-financial sector by banks was allowed together with involvement in insurance trade. In 1988, another significant step was taken where the central bank of Nigeria established the Nigerian Deposit Insurance Corporation (NDIC), mandated to encouraging bank deposit taking to protect and safe guide invested interest.

2.2.3 Brief Overview Reform Measures in Kenya

As in most countries in African, Kenya has one of the robust financial systems predominantly driven by the bank-based segment (Nyasha, & Odhiambo, 2016). Given the dispersed nature of creditors and the opacity of banks; balance sheets, there should be limitations placed on the activities of players in the capital market. As such, from the late 1970s through to the early 1990s, Kenya has had a number of reforms that sought to gradually regularise the bank sector and strengthening the institutional

framework of the entire financial system (Nyasha, & Odhiambo, 2016). The move was to achieve two objectives; first, the exercise was to control the money supply in the system so as to stabilise the macroeconomy. The next objective was to develop the bank institution in line with political and economic priorities for efficient asset allocation. All these were undertaken to regulate and supervise the financial system.

2.2.4 Overview of Ghana's Financial Sector

The financial service industry in Ghana is categorised into three; banking and finance sector, insurance and capital markets. Ghana's financial sector, until the 1990s when privatization was ushered in, was dominated by state owned banks. Due to greater commitments shown by the government of Ghana, the Financial Sector Strategic Plan (FINSSP) was approved by Cabinet in 2003 aimed at broadening and deepening the financial sector (Ghana Investment Promotion Centre [GIPC], 2013).

a. The Banking Sector

The BoG Act 2002 (Act 612) was replaced with the banking Act of 2004 (Act 673) to strengthen the regulatory and supervisory functions (Pwc, 2010). The Universal Banking Business Licence (UBBL) was introduced in Ghana in February 2003 expectedly to bring more competition into the bank industry for efficient service delivery. The introduction of the UBBL came along with a conditional minimum net worth of GH¢7m (excluding statutory capital). It was also a requirement that banks hold 9 percent of cedi equivalent and forex deposit with the BoG on daily basis as primary reserves. Besides, the policy demanded that banks further kept 35 percent cedi denominated total asset as secondary reserves (Pwc, 2010). In Ghana currently, there are 23 banks fully operational as they are deemed to meet all reform requirement demanded by the BoG. There was yet another reform exercise in 2009 among

measures was the increase in the minimum capital of banks to GH¢60m. This was done to make the banks more resilient and to protect them from unforeseen losses. Seeing how vulnerable the bank environment was in 2012, the regulator (BoG) further requested that new entrants into the bank sector provide a minimum capital of GH¢120. Banks that already existed in the industry were urged to accordingly adjust their statutory capital considering their risk status. Accordingly, this move again was taken to strengthen the financial sector so it could support the real economy.

Getting to the close of 2012 December 31st, all banks (foreign and local) had met the policy requirements set by the BoG, pushing the total assets up considerably to GH¢27.2billion, making the sector much resilient and solvent (MyJoyOnline, 2017). This policy initiative was undertaken in 2009, but allowed the local banks to work their way to meeting the requirements by end of 2012 whilst their foreign bank counterparts were given a relatively shorter timeline of 2010 to fulfill their reform requirements, especially the minimum capital. In fact this directive by the BoG improved non-performing loans from an original 14.2 in 2013 to 13.6 percent in 2014. Capital adequacy index of the industry also rose up to 18.6 percent from a previous 17 percent. Operating income for the industry equally witnessed massive improvements following the compliance in 2012. There was an upsurge in operating income by 46 percent to GH¢3.2billion from GH¢2.6billion in 2011. The industry's profit after tax more than doubled to GH¢967.9million from GH¢472,7million (B&FT, 2013). Besides, the balance sheet of the bank industry became more robust owing to the growth in shareholder equity of GH¢3.9billion in 2012 from a previous value of GH¢2.7billion in 2011. The BoG policy directive witnessed a uniform bank base lending rate and without manipulation as were the case in previous liberalised bank system (MyJoyOnline, 2017).

b. The Insurance Sector

Culturally, the practice of pooling resources together against losses (insurance) has been part of the Ghanaian. For instance, members of a community could agree on making periodic contributions toward unforeseen occurrences such as death, sickness and famine times. It is realised that basic reasons for this idea is to perform funerals of lost ones. Officially, the elite form of insurance took the centre spread of the commercial sector in the early 20th century when the British started their trade on the shores of the then Gold Coast (Otoo, 2016). In 1989, the National Insurance Commission (NIC) assumed the supervisory and regulatory role of the insurance sector after it was promulgated by the Insurance Law 1989 (PNDC 227). Quite later, the Insurance amendment Law of 1993 (Law 260) was brought in to inject efficiency into the insurance industry (Otoo, 2016). By the close of 1996 insurance companies in Ghana stood at 20, with two being government owned and eighteen brokers. Then in 2006, the insurance Act (Act 724) which made sure efficiency was improved upon and also made all players in the industry to be compliant to regulatory provisions.

As were the instances under the banking sector, the insurance sector equally regularised their minimum capital requirements to stabilise the industry. The minimum capital requirement had a trend of increasing spanning 2011 and 2015 with respective amounts of GH¢5million and GH¢15million. As part of its reform measures to stabilise and strengthen the financial sector since 2017, the National Insurance Commission has increased its minimum operational capital to support the socio-economic development drive of the country. See Table 1.

Table 1: New and Previous Minimum Capital Requirements (MCR) for Different Insurance Regulated Entities

Entity	Previous MCR	New MCR
Insurance Companies (Life & Non-life)	GH¢ 15m	GH¢50m
Reinsurance Companies	GH¢40m	GH¢125m
Insurance Broking Companies	GH¢300,000	GH¢500,000
Reinsurance Broking Companies	GH¢1m	GH¢1m

Source: National Insurance Company [NIC] (2019)

Current there are 142 regulated insurance companies in Ghana, comprising 24 life insurance, 29 non-life insurance companies, 3 reinsurance companies and 85 insurance brokers and loss adjusters. As of the end of 2018, the total asset worth of the insurance industry was in excess of GH¢6billion. The deadline for complete compliance with minimum capital by all companies in the insurance industry is pegged at middle of 2021 (NIC, 2019).

c. The Capital Market

The Ghana Stock Exchange (GSE) operates two capital markets. Established in 1989, the GSE started trading in 1990 with the mandate to regulate participatory listing companies in accordance with directives laid down by the Securities and Exchange Commission (SEC) per the Securities Industry Act [Act 929] (Asante et al, 2018). Apart the GSE itself, the second capital and stock market it additionally runs is the Ghana Alternative Market (GAX). The GAX was established in 2013 as an auxiliary of GSE to cater for startup businesses and other small and medium sized enterprises. Its establishment simplified the listing procedures and requirements (minimum capital and statutory minimum shareholders) by companies through renegotiations on behalf of these companies with the GSE and SEC. GAX is owes it mandate and operational authority to GSE and SEC as parent bodies. The GSE was adjudged the best capital market in Africa in 2018, and now has an approximate market capitalisation of

GH¢6.1million with 38 equity listing (Asante et al, 2018). Companies that wish to be enlisted on the GSE are require to produce a minimum capital proof of GH¢ 1million, whilst those wanting enlistment onto GAX will show a minimum capital filing details of GH¢250, 000. In the case of their foreign counterparts who express interest in being enlisted on the GSE, a minimum capital requirement of a dollar equivalent of USD 1million is mandatory (Asante et al, 2018). Those companies, who wish to be listed onto the GSE, must in addition to the aforementioned prerequisites, show proof of past successful operations for three financial years prior to application for enlistment. Besides, such a company should have made a pre-tax profit throughout the three-year financial periods (Asante et al, 2018). A minimum of 25 percent of issued shares is require to be floated for public subscription with a minimum of 100 shareholder capacity in respect of GSE and 20 membership for GAX.

2.3 Concepts

These are conceptions that are logically developed as building blocks towards theories that will be dealt with in a particular study (Thompson, 1990). “...researchers need clear unambiguous definitions of concepts to develop sound explanations” (Neuman, 2000, p. 158). As such, this study has considered a number of concepts that are relevant in banking sector reform measures.

2.3.1 Financial Sector

The financial sector of any economy simply refers to institutions and companies that are charged with the provision of financial services to commercial and retail customers. This sector mostly provides mortgage and loan income which increase the in value as interest rates fall. Components of the financial sector include; banks and non-bank institutions. Whereas the bank institutions provide capital for investment

and generation of revenue and also accept deposits, the non-bank financial institutions do not accept deposits but only facilitate consultancy on investments, risk pooling and market brokering. They include the insurance companies, capital markets, pension houses, etc.

2.3.2 Bank Performance

Bank performance refers to the way management uses both material and human resources in the way that enables the achievement of bank objectives. Hajer, and Anis (2016) explain bank performance to mean achievement of set objectives within an agreed time frame at a comparatively lower cost per transaction giving available resources. For instance, the manager of the bank sees bank performance in the form of profitability or competitive urge.

2.3.3 Bank Size

Bank size is measured using the natural logarithm of total asset value in a common denominator usually the US dollar. The ownership of assets by the bank also reflects the bank size. Banks with higher assets are able to offer financial services at lower cost. According to De Young, Hunter, and Udell (2004) bank reform measures and technologies have changed the global bank industry, especially the US by categorizing banks into two; Large banks and small banks. De Young et al (2004) see the first type of bank category as large banking institutions characterised by the use of “hard” information, impersonal relationship and low cost of operations. The latter type rather uses “soft” information, higher operational cost, relationship development and non-standardised loans.

2.3.4 Bank Credit Risk

Credit risk is the possibility of a loss arising from the inability of a debtor to repay a loan. According to Labarre (2020) credit risk traditionally means the risk that a lender may be deprived of his or her principal and interest as a result of interruptions from cash inflows. Although it is difficult to predict with certainty a default in obligation by counterparties, properly assessed and managed credit can lessen the severity of loss. Credit risk is seen as an elongation of the credit process where the bank analyses the potential benefits and costs associated with the loan. Cecchetti, and Schoenholtz (2011) see credit risk as the fear of default or inability of a borrower to go according to contractual agreement by way of non-payment of a loan. Credit risk involves risk of default or fluctuations in debt instruments and derivative valuation which depends on the credit worthiness of borrowers (Loez, & Saidenberg, 2005).

According to Noomen, and Abbes (2018), credit risk is known to be one of financial risks that need to be cautiously monitored and supervised in order to reduce the tendency of default. Pockets of incidences such as inability to adhere to the monitoring process on records of borrowers and in other instances when there is a political instability in the governance system have facilitated increase in default rate. Borrowers are to be monitored and supervised to ascertain their ability to repay the borrowed monies with interest (Adde-Korankye, 2014; Munangi, 2020). The level of bank stability improves with a diminished loan to deposit ratio. Jeon, and Lim 2013 (cited in Alharthi, 2017) posit that banks with fewer loans are able to enhance their stability through coverage for clients' withdrawals. This means provision of fewer loans leaves enough liquid assets for creditor obligational needs.

2.3.5 Liquidity Risk

Cecchetti, and Schoenholtz (2011) identify a risk of uncertainty emanating from panic withdrawals of funds by depositors from banks (liquidity risk) as one of financial risks. In effect, a firm is said to be illiquid when it loses its ability to settle its financial obligations without unacceptably incurring losses. Liquidity risk therefore arises when bank management expresses fear of their ability to settle maturing indebtedness. When it occurs this way, the legal implication is that such a firm is in default (Nikolaou, & Drehmann, 2010). Since liquidity risk is in bed with funding liquidity, Nikolaou, and Drehmann (2010) define funding liquidity as *the ability to settle obligations with immediacy*. Following this definition, it is clear that funding liquidity risk could mean a time frame within which a firm is unable to settle its indebtedness. Banks' inability to raise funds due to maturity mismatch between cash inflows and outflows constitute liquidity funding risk (Duttweiler, 2009). This brings to bear the relevance of differentiating between funding liquidity and liquidity risk; funding liquidity is binary in concept, thus, either a bank is able to oblige to its debt or unable to do so. With liquidity risk, it is futuristic and over a time horizon (Nikolaou, & Drehmann, 2010).

One of the most revered reforms of the Basel Committee on Banking Supervision [BCBS] (2013) is maintenance of Liquid Coverage Ratio (LCR) as the promotion for a short-term resilience of liquid risk profile of banks. This regulatory demand was also to ensure maintenance of optimum stock of unencumbered high quality liquid assets easily convertible into cash without losing their value to meet daily financial obligations for at least a 30 day period. The LCR was rolled out in January 1, 2015 with a minimum start rate of 60 percent subject to an annual flat equal incrementals of 10 percent till January 1, 2019 when it was earmarked at 100 percent (Maverick,

2018). This gives Policymakers and regulatory authorities in the bank industries the mandate to enforce that banks hold a significant level of their assets in liquid for financial system stability (Bernanke, 2008).

3.4 Theories Underpinning the Study

The reason for a theoretical review is to concretely assess the corpus of theories that have been considered in relation to a topical issue under discussion. It looks at the relationship between theories and the subject matter and how they are integrated. In this study, two theories are linked to bank reforms; the financial intermediation theory and the money creation theory which underpin this current study.

3.4.1 The Financial Intermediary Theory

This theory holds that banks play the role of deposit gathering and loan lenders (Werner, 2015). Banks are said to create liquidity through borrowing on short term basis and in turn lend out to customers on long term basis (Dewatripont et al, 2010). What this theory wants to put across is that, banks borrow funds on short maturity dates and rather lend to needy firms or customers on a long maturing dates for repayments. This theory owes its origin from proponent like Von Mises (1912) who is on record to have said;

The activity of the banks as negotiators of credit is characterised by the lending of other people's, that is, of borrowed, money. Banks borrow money in order to lend it; ... Banking is negotiation between granters of credit and grantees of credit. Only those who lend the money of others are bankers; those who merely lend their own capital are capitalists, but not bankers (Mises, 1980, p. 294f).

This theory is so linked to bank sector reform measures and bank performance in an interesting style. In a lending process, banks are not left the hock to go “*holidaying*

with excessive” lending which in most instances involve insider lending. It is observed that, in most documented cases, bank collapse and distress arise from excessive lending to the public, whose thirst for default is high. Under the backward looking loan provisioning culture where provisions are allowed to flourish, higher levels of non-performing loans are triggered thereby exposing the bank to fragility (Hasan, & Wall, 2004). You may want to provide an answer to this question; to extent do supply constraints in lending impede bank recovery after a collapse? This question has no definite answers. It is realised that both the supply and demand factors appear to have played various roles in the launch of regulatory measures to contract bank lending. Excessive and unregulated lending has led to the collapse of the biggest banks in the world (Chui, Domanski, Kugler, & Shek, 2010; Juabin, & Bawa, 2020). Due to this, bank lending witnessed more regulations in most countries to check vulnerability and to protect banks from poor performance which could pave way for their exit from the industry.

As indicated earlier on the core functions of banks, Mises (1980) reiterated that lending is not the only function of the bank, gathering savings is yet another important function. In his General Theory, Keynes (1936) succinctly states that for investments to thrive, banks first need to gather savings. It is from these savings that the lending function can be smoothly executed. This savings function only brings positive results when done prudently on the domestic economy. When domestic efforts to gather savings for economic growth appear unsuccessful, domestic banks could rely on international banks to fill the gap created by missing domestic savings through lending from abroad. This logic has however has outlived its significance as it increase foreign borrowing by developing countries (Werner, 2016). Again, this draws into the picture the need to regulate external quest for financial assistance by

domestic banks in developing countries. If the practice of sourcing financial aid abroad is left unregulated, it certainly exposes the banking sector to much instability. In a sharp rebuttal in the next immediate paragraphs, the theory of money creation seems at odds with the financial intermediation theory, as it argues that banks do not need to create money out of deposit but could do so out of nothing (Macleod, 1856; Schumpeter, 1912; Wicksell, 1898).

2.4.2 The Money Creation Theory

According to Werner (2016), the failure of leading economies to integrate banking into their economic theories constitutes a flaw in banking and finance literature. As such, concerns raised by Werner (2015b) about the need to link the money creation theory to the banking sector reforms and how it affects bank performance are dwelled on. The money creation theory happens to be one of dormant old theories that have been successfully linked to bank performance in bank literature. It posits that money could be created out of nothing by way of using accounting operations through disbursement of loans to customers. The theory emphatically states that banks do not necessarily need to gather savings or reserves before they lend, rather could lend or create new credit or deposit money by merely electronically increasing balances of customers without a commensurate decrease elsewhere (Haln, 1920).

The most vociferous supporter of this theory is Macleod (1856) who argues that money needs not be issued or change hands physically by way of a dog-tail syndrome where one customer's cash till is debited with a corresponding credit to another customers who seeks bank loan. Instead, money could be credited electronically by effecting increase in total balances of customers using accounting practices. He notes that about 30 percent of total money supply in circulation is physical cash, the rest is

electronic balances. He further states, and I quote him; *“These banking Credits are, for all practical purposes, the same as Money. They cannot, of course, be exported like money: but for all internal purposes they produce the same effects as an equal amount of money. They are, in fact, Capital created out of Nothing”* (Macleod, 1856, p. 408).

This message by Macleod (1856) was further elaborated and spread far and wide by Withers (1909). He was once quoted as saying; *“In old times, when a customer went to a banker for a loan, the banker, if he agreed, handed him out so many of his own notes; now when a customer goes to a banker for a loan, the banker gives him a credit in his books, i.e. adds to the deposits on the liability side of the balance sheet”* (Withers, 1918). Money creation in reality is quite different from public perceptions and misconceptions. How much money is available in circulation depends on the central bank’s monetary policies. The central bank can do one of many ways to create money; setting interest rates, purchasing assets and physical money printing (this is rarely done). Broad money is the total amount of legal tender for payments and settlements of debts that is held by households and companies (McLeay, Radia & Thomas, 2014). This includes bank deposits usually in the form of IOU from commercial banks to persons and companies and physical currency also from the BoG. Bank deposits makeup about 97 percent of broad money in circulation with the remaining being physical cash in the hands of the public for physical contact purchases. (McLeay et al, 2014).

This theory’s relevance in the study emanates from the fact that excessive loan disbursement commercial banks throw the macroeconomy into an environment of inflation thereby affecting bank performance. The bank will have to expand that much

on operational cost relative to income it generates, as the value of money now falls. In realising that commercial banks engage in overly loan disbursements, the central bank comes in to institute monetary and physical policies to reduce too much money in circulation. Therefore, bank sector reforms are seen to positively impact bank performance in this regard.

2.5 Empirical Review

This aspect of the study deals with past studies largely on bank-based financial sector reforms across the globe and on the African soil. Concentration will however be given to areas of specific research objectives.

2.5.1 Effect of Bank Size on Bank Profitability

Many stakeholders in the bank industry are still at a crossroad as to the optimal bank to operate with. The question that then usually arises is; are big banks different from small banks in terms of earnings ability? Following this ambiguity, the researcher pursued a study by de Haan, and Poghosyan (2011) who used quarterly dataset for non-investment banks in the US within the period 2004Q1-2009Q2 to establish how bank size impacts bank earnings volatility. Their findings show that bank size-profitability is a non-linear one. Besides, they study also found that the negative impact of bank size on bank earnings volatility on one side reduces with a rise in market concentration. In 2012, De Haan, and Poghosyan (2012) again undertook a study and realised bank size-profitability was one of a positive relationship. Košak, & Čok (2008) researched in to bank ownership and bank profitability. They use data between 1995 and 2004 from six South-Eastern European countries. To them, bigger banks are more preferable to smaller banks due to the advantage of economies of

large scale operation which brings higher profits. Athanasoglou, Delis, and Stakouras (2006) linked bank size to bank profitability in their study on the effect of specifically selected variables on bank profitability. In Turkey, Tunay, and Silpar (2006) investigated profitability determinants in the Turkish bank industry and revealed that bank size was positively correlated with bank profitability. Within the same industry in Turkey, Sayilgan, and Yildini (2009) used dataset from the 2002-2007 financial year identified bank size measured by asset growth to negatively relate with return on assets and return on equity.

Similarly, Kosmidou (2008) used an unbalanced dataset of 23 banks from Greek to examine the determinants of bank performance in Greek spanning 1990-2002. They found a positive relationship between bank size and bank performance in terms of earnings. In the case of Adusei (2015), he studied profitability of 112 rural and community banks in Ghana. He found among others that, bank size was a significant predictor of rural and community banks' profitability. In another development, Sufian, and Habibullah (2009) and Ben, Naceur, and Goaid (2008) reported revealed an evidence of negative relationship bank size and bank profitability. In Nigeria, Obamuyi (2013) determined banks' profitability using the fixed regression analysis panel dataset from 2006-2012. He established a statistically negative relationship between bank size and bank profitability annexed by ROA. Within the same country, Manyo, Ndifon, and Anake (2019), studied bank specific determinants of profitability using data from 2007-2016. Employing ex-post facto research design, the study established that bank size was significantly positive in determining bank profitability. Contextually, Lipungna (2014) in Malawi conducted his study of bank specific variable profitability determinants and realise bank size had a negative relationship with bank profitability. Naceur (2003) conducted a study in Tunisia with data between

1983 and 2000. He realised banks with high amount of capital enjoyed high profitability.

2.5.2 Effect of Credit Risk on Bank Profitability

So far, available literature on the relationship between bank credit risk and bank profitability is a mixed one. For instance, Adusei (2015) reports in his study of rural and community banks' profitability that return-risk hypothesis predicts that each time the bank's loan-to-asset ratio is higher, then such a bank is much exposed to instability. As such he finds the relationship between credit risk and bank profitability in Ghana to be positive. Still in Ghana, the works of Li Mei, Nsiah, Barfi, and Osei-Assembly-Bonsu (2019) provide evidence a negative relationship between credit risk and bank profitability. Using panel data between 2010 and 2015 from Ghana, Opoku-Mensah, Nyakum, Takyi, and Ampofo (2019) re-examined the impact of credit risk on bank performance. Their result shows that credit risk had a statistically significant inverse relationship with bank performance. The impact of credit risk on profitability of Ghanaian banks was studied as part of his thesis collecting data between 2005 and 2013; Opoku (2015) used ROA and ROE as proxies for bank profitability. The results show that credit risk had a negative link with bank profitability. As were the case with Adusei (2015) who studied rural and community banks' profitability in his paper, Adjeitsey (2015) equally researched into rural banks' profitability in Ghana for his thesis. His study finds a positive relationship between credit risk and rural banks' profitability.

A study on credit risk and bank performance by Kani (2017) with evidence from the West African Economic and Monetary Union Countries, he finds a statistically significant negative relationship between credit risk and bank performance. In the

case of Kargi (2011) in Nigeria, he observed that credit risk has an inverse relationship with bank profitability. Another supportive result was revealed by Kaaya, and Pastory (2013) when they studied Tanzanian banks' profitability determinants. They concluded that credit risk-profitability is inversely correlated with bank performance. Naceur, and Omran (2008) studied banks from North Africa and found a positive relationship between credit risk and bank profitability. On the Zimbabwean bank industry, Njanike (2009) realised that credit risk had an inverse relationship with bank performance. By this revelation, Njanike suggested that credit scoring should be implemented and again, there should be a review of credit disbursement policies. Rather with an interesting finding, Kithinji (2010) from Kenya revealed that, non-performing loans and credit giving did not have any effect on bank profitability in Kenya. In an opposing fashion, Kolapo, Ayeni, and Oke (2012) re-emphasised the positive relationship between credit risk and bank profitability in the Nigerian bank industry.

On the transcontinental soil, Ekinci, and Poyraz (2019) studied the effect of credit risk on financial performance of deposit banks from 2005 to 2017 in Turkey which lies between Western Asia and Southeastern Europe. Using ROA and ROE as proxies for profitability, the study found credit related negatively with both ROA and ROE. Interestingly enough, Tan, and Floros (2012) showed an evidence of negative relationship between bank credit risk and bank profitability, in their study of Chinese banks. Other contracting results were produced by a study conducted in Sub-Saharan African 41 countries by Flamini et al (2009), when they declared that bank credit risk is positively related to bank profitability. Serhat's (2018) study of the relationship between credit risk and bank performance using 13 post-soviet countries realised credit is major in determining bank profitability. In Bangladesh, Noman, Peryin, and

Chowdhury (2015) investigated the effect of credit risk on bank profitability and found a positive relationship between the two variables.

2.5.3 Effect of Liquidity Risk on Bank Profitability

It is generally acknowledged that banks usually decrease insolvency challenges by way of maintaining high liquid assets that can easily be converted into cash without necessarily losing their value (Adusei, 2015). As one of the specific objectives, the research sought to establish the effect of liquidity risk on bank performance in terms of profitability. Liquidity risk reflects the tendency that a bank might not be able to satisfy the demands of customers in the short period. Adusei' (2015) results are in line with those obtained on Table 4.5 as he established a statistically significant positive relationship between liquidity risk and bank profitability (ROE). Other set other studies think maintaining higher liquidity saves the bank better from instability issues (see Curak et al, 2012). Bourke (1989) equally found some evidence of a positive relationship between liquidity risk and bank profitability when he studied 90 banks in Europe, North America and Australia between 1972 and 1981. However, Molyneux and, Thornton (1992), and Goddard et al (2004) produced mixed evidence of any such negative relationship between those two variables for European banks in late 1980s and mid-1990s respectively. In a similar development, a paper by Berger (1995) brought up a model analysis where he sought to statistically establish the relationship between bank earnings and its capital for US banks over the period of 1983 and 1989. He notes that, contrary to the widely held notion with symmetric information, there is a positive relationship between capital and return on equity (ROE). Sufian, and Habibullah (2009) have documented their evidence to the effect that bank capitalisation has a positive impact on bank profitability. This came up when they studied the determinants of bank profitability in China. Earlier studies of Goddard et

al (2004) posit that higher capital adequacy maintenance by a bank means overly being cautious to the neglect of profitable ventures and trading opportunities. This implies that capital adequacy; according to them has an inverse relationship with bank profitability.

Funding risk is one of the variables that this study controls for. Adusei (2015) established that FUNDRISK has a statistically robust negative relationship with bank profitability under ROE. As more funding avenues are opened, profitability is expected to increase all things being possible. However, when customer deposits improve, banks are usually motivated to create money in the system.

Shifting the focus of the study to the relationship between the dependent variable (ROA) and the regressor variables, it is first observed that there was BSIZE had a statistically significant positive relationship with bank profitability proxied by ROA. In their examination of the determinants of bank performance through profitability, Krakah, and Ameyaw (2010) found among others that, bank size is instrumental in determining bank profitability. Corroborating this finding, Adusei (2015) finds larger bank size to have a statistically positive relationship with bank profitability and by protraction helpful to the bank because, increase in bank operations improves profitability. Therefore, efforts to regulate bank size as a means of stabilising the financial sector should be done with caution since these results are in favour of increase bank size. These findings are in-sink with the economic argument about big bank having the ability to promote better asset diversification with the advantage of reducing risk of default and also allows banks to be able to cushion up operations with stabilise funding source and structure (Adusei 2015). Supporting this revelation, Steve (2007) argues that smaller banks are more vulnerable due to their inability to

diversify their assets. He used data from US bank holding companies from 1986 to 2003.

In a differing instance, Carter, and McNulty (2005) found an inverse relationship between bank size and bank net return on business lending. Berger et al (2005) established similar results in their study by emphasising that smaller banks have superior ability to allocate capital to risky borrowers. In their analysis of the relationship between bank size and earnings volatility, Boyd, and Runkle (1993) found that there was a statistically significant inverse relationship between bank size and ROA. Generally, bank-size relationship is expected to be positive if bank asset growth is done with caution. After a certain level of increase in bank size, there is the possibility of diseconomies of scale setting in. Therefore any move by regulatory bodies to place a restriction on bank size should not be seen as a repugnant policy in certain instances.

One of the challenges of banks is loan loss possibility. This is referred to as credit risk, which involves fear of default or fluctuations in debt instruments and derivative valuation which depends on the credit worthiness of borrowers (Loez, & Saidenberg 2005). The sense here is that, with better management practices, fees, interest and commissions charged loans to customers constitute a portion of internally generated income of banks, and by extension will have a positive effect on bank profitability. Kutum (2017) found a positive but weak relationship between credit risk and bank profitability proxied by ROA. Supporting results of Kutum (2017), Hosna et al (2009) revealed a link between credit risk and bank profitability. Studies which found contrary results include those of Adusei (2015), Almekhlafi et al (2016), Felix, and Claudine (2008), Noman et al (2015), Athanasoglou et al (2005), Kargi (2014),

Kaaya, and Pastory (2013), Chimkono, Muturi, and Njeru (2016). Their arguments are seen in the wisdom that the level of bank stability improves with diminished non-performing loans. Jeon, and Lim (2013; cited in Alharthi (2016) equally revealed that banks with fewer loans are able to enhance their stability through coverage for clients' withdrawals. This means provision of fewer loans leaves enough liquid for creditor liquid asset needs.

Since bank liquidity is one determinant of bank profitability, it is worthwhile to indicate that bank stability is the function of bank performance in terms of profitability. As such, to avert the issues of insolvency, banks maintain higher liquidity assets which are easily converted into cash (Curak et al 2012). Banks usually maintain higher liquid assets (lower-loan-to-deposit ratio) to avert the inability to oblige to customer demands. This however reduces potential income generation since fewer funds will be available for investment. The reverse lower liquid maintenance culture has a direct economic implication, thus, more funds will be used to invest but rather exposes the bank to overruns. In other evidenced instances, bank liquidity risk has also been linked positively to bank profitability (Dang, 2011, cited in Ngaira, & Miroga, 2018, Kosmidou (2008), and Schumacher (2000). The ratio of liquid assets to customer and short term funding was also positively linked to bank profitability [ROA] (Kosmidou, Tanna, & Pasiouras, 2005). Consolidating this position, Olagunju, David, and Samuel (2012) found a significant positive relationship between bank liquidity and bank profitability and by elongation bank stability.

Other studies that report negative relationship between liquidity risk and bank profitability and by elongation bank stability are those of Molyneux, and Thornton (1992), Sohaimi (2013), Mohammed et al (2018), Khan et al (2017), Tabari, Ahmed,

and Emami (2013) and Bourke (1989). While this negative liquidity-bank performance hypothesis appears to catch the public eye, there is counter evidence which preaches the need for a trade-off between resilience to bank liquidity shocks and holding cost of less liquid assets (Marozva, 2015). Demirguc-Kunt, and Huizinga (1998) reported mixed results in a study on liquidity risk-performance relationship. Whilst positive relationship was established between liquidity risk and net profit margin, return on internal assets negatively related with liquidity risk.

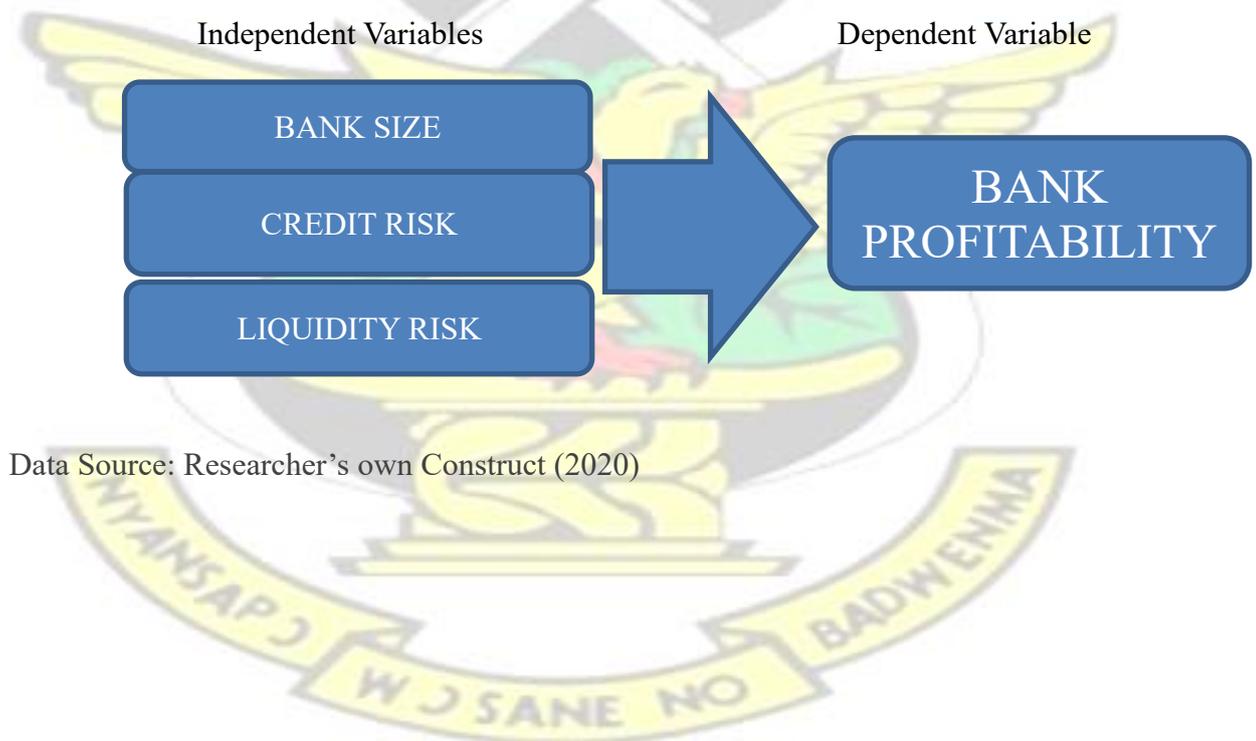
Pasiouras, and Kosmidou (2007) found a positive relationship between banks capital adequacy and bank profitability thereby less exposed to bankruptcy. Other studies who established that banks with higher levels of capital perform better than their counterparts who are less capitalised include those of Staikouras, and Wood (2003) who posit that greater equity is positively related to bank profitability when they studied EU banks. Abreu, and Mendes (2001) equally trace higher equity capital to positive profitability. Contrary to studies which found positive relationship between capital adequacy and bank profitability, Ali et al (2011) identified that bank profitability is inversely related with capital when they studied Pakistani banks using ROA as a proxy of bank profitability. This revelation was made when they examined the determinants of profitability performance in the Pakistani bank industry between 2006 and 2009. In the case of Al-Tamimi (2006) he studied the determinants of commercial banks' performance in the United Arab Emirates and found that bank capital inversely impacted bank performance in terms of profitability. In a similar research, Kundid (2012) realises that higher capital adequacy negatively impacted profitability.

Banks have in many instances struggled to find funds for operations of any kind with comparable difficulty. Funding risk has been identified as one challenge that has stifled bank performance in the industry. Adusei (2015) linked FUNDRISK positively to bank profitability. This risk has virtually been on holiday in risk analysis. In this study what our results show explain that, as funding risk improves, profitability increases and vice versa.

2.6 Conceptual Framework

The conceptual model has bank size, bank credit risk and bank liquidity risk as the independent variables while bank profitability is the dependent variable (Figure 1).

Figure 1: Dependent and independent variables



Data Source: Researcher's own Construct (2020)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section discusses the research design and other processes that were followed to collect data for analysis on financial sector reform measures and their effect on bank performance. Sub-headings to consider under this section include; the design, target population, sample size and techniques used to choose the sample, the type of data, time frame of data collection, model specification and data analysis tools.

3.2 Research Design

This study used a descriptive design to establish the effect of financial sector reform on bank performance in Ghana. The nature of the data required for the analysis informed the choice of approach adopted. The use of descriptive design allowed for in-depth evaluation of the existing situation under study boarding on what, where and how about the phenomenon Cooper, and Schindler (2003). This study therefore was able to generalise the findings to all the banks. This approach allows data to be mathematically manipulated, unlike in a qualitative approach where human bias is so much involved.

3.3 Target Population of the Study

The population of interest in this study comprises all banks that had their annual financials ready for download within the time frame of interest to the researcher. In effect, all banks in the Ghana bank industry were qualified to be selected for the study. An estimated 23 banks were operational as of the time data were collected from the websites of the selected banks.

3.4 Sample and Sampling Techniques

This current study made used a sample of nine (9) banks covering 2008-2016 financial years. These banks from whose websites data were collected included: AGRICULTURE DEVELOPMENT BANK, ECOBANK GHANA, SG-SSB GHANA, GCB BANK, HFC BANK GHANA, CAL BANK GHANA, ABSA BANK, SC-BANK and FIDELITY BANK GHANA. This sample was purposively selected. Banks that qualified for selection were all who met the minimum capita (GH¢400m) and readily had their annual financials uploaded to their websites for accessibility.

3.5 Data Type

Secondary data of the sampled banks from the Ghana Bank Industry were used for this study. In essence, data used here were obtained from annual audited financial reports for the period 2008-2016 which spans a nine (9) year period. The basic reason for using data from 2010-2018 is because the study sought to find out how banks were performing prior to the bank sector reform measures in 2017 in Ghana. In this way, one may be in a seemingly better position to conclude or justify the reasonableness of the bank sector “health check” by the Bank of Ghana (BoG).

3.6 Diagnostic Test

3.6.1 Hausman Test

In some instances, the Hausman Test (also referred to as the Durbin-Wu- Hausman [DWH]) is taken to mean model specification. It is an approach used to detect endogenous regressors in a regression model (Chmelarova, 2007). Endogenous independent variables are those predictors whose outcomes are mostly influenced by other external factors in the bank system. The Hausman Test therefor is used to take

care of these “foreigners” that can throw off gear the results of a particular model outcome. The Hausman Test prevents endogenous variables from distabilising the results of an Ordinary Least Square estimators (Hausman, 1978). In using the panel regression analysis (data analysis over a predetermined time period) the DWH is relied on to choose between the fixed and random effects models. Interpretation of the Hausman Test is simple; if the p –value is small, usually less than 0.05, reject the null hypothesis (which supports the random effects model), and accept the alternative hypothesis that is in favour of the fixed effects model.

3.6.2 Fixed and Random Effects Models

The study used both the fixed and the random effects models to analyse data. The fixed and the random models are commonly applied when dealing with panel or cross sectional time series dat. The use of the fixed effects model becomes appropriate when a researcher thinks there are certain variables in the model that are omitted but by their nature have a correlation or influence on the variables that are currently present in the model. In this way, the fixed effects model is best in controlling for omitted variables that will have an impact on the outcome of the results produced by the model. It will cater for bias results (Williams, 2018). For this rule to smoothly work the said omitted variables must be time-invariant; meaning those variables should not change over time, eg, human race, gender. And so, the fixed effects model seeks to control for or partial for changes in values and effects of missing variables.

Conversely, the random effect or null-hypothesis supported effects becomes the inevitable model to use when the omitted variables are not correlated with the explanatory variables used in the model. In this manner, the results can be relied upon to make a conclusion because they will be unbiased. It must be made clear here that,

unbias results are used in the sense of minimal or negligible errors, not the absence errors, no! It means the variables that are missing from the model are subject to change over time and therefor referred to as time-variant variables. *Quoting Allison (2009), "In a random effects model, the unobserved variables are assumed to be uncorrelated with (or, more strongly, statistically independent of) all the observed variables."*

Using ROA as proxy for bank profitability, the random effect model was found to be the appropriate model in determining the effect of financial sector reform on bank profitability. This was made possible by the Hausman Test (see Table 5).

3.7 Econometric Specification

Panel regression technique was used to analyse the effect of financial sector reform measures on bank performance. According to Vong and Chan (2009), the use of panel regression data has the advantage of revealing more information as it consists of the cross sectional information which shows individual variable variability, and the time series information which also captures dynamic facts about subjects under study. In essence, panel modelling tells a story of identifying common group characteristics, at the same time making provision for heterogeneity that exists within individual variables. In this study a functional linear model is used since it is known to produce better results (Short, 1979; Bourke, 1989). It is notable that, the fixed and random effects models are improved versions of the constant or pooled, otherwise referred to as ordinary least squares (OLS). The equation used for the purpose of analysis is of the form below;

$$Y_{it} = \beta_0 + \beta_1 (SIZE_{it}) + \beta_2 (CRISK_{it}) + \beta_3 (LRISK_{it}) + \beta_4 (FUNDRISK_{it}) + \beta_5 (CAR_{it}) + \varepsilon_{it} \dots \dots \dots (1)$$

Where;

Y_{it} = ROA or ROE for bank i at time t ,

SIZE = Bank Size (Proxied by log of Total Assets)

CRISK = Credit Risk (Total Loans / Total Assets)

LRISK = Bank Risk Taking ability (Proxied by Cash & Owings at a Depository to Total Assets)

FUNDRISK = Funding Risk (Z-Score = Ratio of Total Deposits to Total Assets + Equity to

Total Assets Ratio divided by the Standard Deviation of Total Deposits to Total Assets)

CAR = Capital Adequacy Ratio (Proxied by Equity Capital to Total Assets)

β_0 = Constant,

ε_{it} = Error term

β_1 to β_5 = Coefficients of respective regressor variables in the study

3.8 Study Variables

This study used three types of variables; Dependent, Independent and Control variables. The dependent variable is the factor the study is trying to predict and is bank performance in this study. It is proxied by bank profitability proxied by return on assets (ROA) and return on equity (ROE). The independent variable is that factor that influences the dependent variables. Bank size, credit risk and liquidity risk are the predictor or regressor variables. The third variable in this study is the control variable.

The control variable refers to that factor in the model or equation whose presence can influence the behaviour of the independent variable. The control variables in this study are funding risk and capital adequacy ratio of banks. Table 2 gives details of variable definitions.

3.8.1 Variable Definitions

Table 2: Variable, definitions and notations

VARIABLE	DEFINITION	NOTATION
<u>Dependent Variable</u>		
Return on Assets	Profit before interest and tax divided by total assets (%)	ROA
Return on Equity	Profit before interest and tax divided by total equity (%)	ROE
<u>Independent Variables</u>		
Bank size	Natural logarithm of total assets	BSIZE
Credit risk	Total loans to total assets ratio	CRISK
Liquidity risk	Cash to total assets ratio	LRISK
Control Variables		
Funding risk	Z-Score = Total deposits to assets ratio plus Equity to total assets ratio divided by the standard deviation of profits before interest and tax to assets ratio	FUNDRISK
Capital adequacy ratio	Equity capital divided by total assets	CAR

Source: Adopted from Adusei (2015)

3.9 Data Analysis Technique

Having downloaded financials of the selected banks' websites, financial ratios were used to simplify raw figures into a semi useful form which could aid coding. The various ratios obtained were then used to compute for the independent and control variables to predict the status of the dependent variable. Coding of data was done using the statistical tools such as Microsoft Excel and STATA 16.1 to analyse and turn out results for inferences to be made. Results obtained this way were presented in

the form of Descriptive statistics and Correlation Matrix. To determine the relationship between independent variables and bank performance, multiple regression analysis was used through the aid of the Hausman Test to determine the usage of either the fixed or random effects models. This made it possible to arrive at a meaningful conclusion on results obtained.

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CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, results and data analysis are presented in accordance with the models specified under the immediate preceding chapter (chapter three). Descriptive statistics of data begins the presentation and swiftly followed by correlation analysis. Then multi-regression analysis using fixed and random effects models will constitute the second department of the presentation adopting return on assets and return on equity as proxies for bank performance annexed by profitability. This is followed with explanation and discussion of results and their implication to theory and practice.

4.2 Descriptive Statistics

Descriptive statistics helps summarise data into a meaningful form so that patterns can emerge. It visually shows what the data depicts by interpreting relationships between and among studied independent variables and how they impact the dependent variable casually. It does not however allow for conclusions to be made. Specifically, the study discusses the mean, standard deviation, minimum and maximum values of the variables. Having done this, the study goes further to discuss the correlation coefficients of paired variables. See Table 3 & Table 4 for descriptive statistics and correlation matrix.

Table 3: Descriptive Statistics

Variable	Obvs	Mean	Std.v	Min	Max
ROA	81	3.72	3.17	-4.7	9.18
ROE	81	0.14	0.03	0.10	0.18
BSIZE	81	6.74	0.99	5.60	9.30
CRISK	81	0.45	0.12	0.19	0.64
LRISK	81	0.18	0.11	0.01	0.41
CAR	81	0.15	0.11	0.05	1.10
FUNDRISK	81	8.88	0.97	6.60	10.10

Data source: Computation from Bank Financials (2008-16)

Notes: ROA (Return on Assets), ROE (Return on Equity), BSIZE (Bank Size), CRISK (Credit Risk), LRISK (Liquidity Risk), CAR (Capital Adequacy Ratio) and FUNDRISK (Funding Risk).

Considering the measurement of bank profitability proxied by ROA and ROE, irrespective of the bank, an average bank from the sample makes an ROA of 3.72 percent with a corresponding standard deviation of 3.17, as against a mean of less than 1 percent score for ROE which also makes a standard deviation of 0.03 percent. In both these two profitability measurement scenarios, although positive results were produced, ROA relatively did well. Whilst ROA has a maximum value of 9.18, its minimum value was negative. With comparatively a lower maximum value of 0.18, ROE recorded a positive minimum value of 0.1

In the case of independent variables, it was observed that Bank size had an average score of 6.74 percent with a typical bank making a maximum score of 9.30. The minimum score recorded by an average bank within the sample was 5.60, signifying a well skewed performance among the banks in terms of bank size. A standard deviation of less than 1 percent was recorded still pointing a centrally dispersed bank size performance. Funding risk happened to record similar results, as an average bank obtained a mean of about 8.9 percent with a corresponding standard deviation of 0.97.

The maximum and minimum scores were respectively 10.1 and 6.6. . Although the variance appears to be on the high side compared to other independent variables, it also has a higher mean. During the same period, the liquidity risk had a low mean pointing to good performance as its standard deviation was also 0.11. Higher percentages in terms liquidity risk are not preferable. This performance is reflected in the maximum score in terms of liquidity risk which is 0.41. Sampled banks appeared to have done well in their credit risk scores. An average bank scored a mean of 0.45, still denoting creditable performance. It means the probability of an average bank losing its loaned out funds was not up to one percent with the maximum score even still not up to 1 percent. The standard deviation was quite on the low side reflecting uniformity in credit risk performance among the banks.

4.3 Correlation Matrix

Under this section, the study tries to establish how studied variables are related. This relationship could be between dependent and independent variables or between paired independent variables. Emphasis is placed on the strength and direction of relationship. A correl value of 0.8 or more between paired variables tells a story of collinearity challenges and therefore cannot be put in the same equation or model (Schindler, & Cooper 2009). Table 4 gives detail results.

Table 4: Correlation Matrix

	<i>ROA</i>	<i>ROE</i>	<i>BSIZE</i>	<i>CAR</i>	<i>FUNDRISK</i>	<i>CRISK</i>	<i>LRISK</i>
ROA	1.00						
ROE	0.84	1.00					
BSIZE	0.03	0.04	1.00				
CAR	0.09	0.04	0.24	1.00			
FUNDRISK	0.06	0.04	-0.19	-0.27	1.00		
CRISK	0.07	0.22	-0.08	0.12	-0.28	1.00	
LRISK	0.05	-0.36	-0.23	-0.07	0.06	-0.22	1.00

Data source: Computation from Bank Financials (2008-16)

Notes: ROA (Return on Assets), ROE (Return on Equity), BSIZE (Bank Size), CRISK (Credit Risk), LRISK (Liquidity Risk), CAR (Capital Adequacy Ratio) and FUNDRISK (Funding Risk).

Table 4 contains the correl values of studied variables showing their strength and direction of relationship. It is observed that bank performance annexed by ROA reveals a weak relationship with all independent variables, except in the case of ROE which is equally a rival bank performance outcome variable. Since correlation is about strength and direction relationship between paired variables, it is realised that ROA has a strong positive relationship with ROE at 0.84 correl value. This contravenes the correlation matrix rule, where a correl value up to 0.8 or more depicts a case of collinearity and therefore cannot best fit in the same model at the same time (Schindler & Cooper 2009). The inference here is that, ROA and ROE cannot be in the same equation because the outcome and behaviour of each of these variables will be influenced by the other, and therefore must be separated. In the case of the relationship between ROA and the regressor variables, it is established that there exists a weak positive relationship between them when paired at separate times in the model.

With the exception of CRISK where the correl value in the relationship between ROE and the predictor variables is quite high and positive (0.22), ROE maintained a weak positive relationship with other predictor variables except in the case of LRISK where negative relationship was established. Overall, the correl values show that there is comparatively a stronger relationship between ROA and regressor variables than it is with ROE and predictor variables. What it informs readers is that; bank performance proxied by ROA does better than annexed by ROE. Using correlation analysis this way, the researcher only gains a scratchy grasp of analysis. The real insights are obtained under the regression analysis which the researcher shall be considering in the next sub-heading.

4.4 Multi-Regression Analysis

A regression analysis was conducted to test the effect of financial sector reform measures on bank performance. Given the fact that the study had more than one independent variable, multiple linear regression model was adopted. According to Mugenda, and Mugenda (2003), a multiple linear regression model is used when a group of independent variables together predict a given dependent variable. A multiple-regression model is used to measure the effect of two or more independent variables on a single dependent variable which may have sub-categories. To do this smoothly, the fixed and random effects models were employed through the Hausman Test. Table 5 presents a case of both the fixed and the random effects models to identify which model is appropriate to be used for inferential reasoning and conclusions to be reached. The ROA is used as a proxy for bank profitability.

4.4.1 Hausman Test (Model I for ROA)

Table 5: Hausman Test (Model I for ROA)

Var	Coefficient			
	(b) Fixed	(B) Random	(b-B) Difference	sqrt (diag(V_b-V_B)) S.E
BFSIZE	0.031	0.249	-0.218	0.282
CAR	-0.084	-0.077	-0.007	-1.210
FUNDRISK	-0.001	-0.001	0.000	0.001
CRISK	0.060	0.033	0.027	0.034
LRISK	-0.077	-0.147	0.623	0.430

Data source: The Hausman Test (2020)

b=consistent with H_o and H_a ; obtained from xtreg

B=inconsistent under H_a ;efficient under H_o ;obtained from xtreg

Test: H_o difference in coefficient not systematic

$$\begin{aligned} \chi^2(5) &= (b-B)' [V_b - V_B]^{-1} (b-B) \\ &= 10.03 \end{aligned}$$

Prob > $\chi^2 = 0.1537$

($V_b - V_B$ is not positive definite)

As mentioned earlier, the Hausman Test was used to determine which of the two models (fixed or random effects) should be adopted as the appropriate model to explain the effect the financial sector reform has on bank profitability in Ghana. The results showed that the null hypothesis could not be rejected in favour of the alternative hypothesis which prefers the fixed effects model, and by principle, the random effects model was used. This was because the p -value was 0.1537 (see Table 5) which was greater than the alpha value of 0.05 as an error term. Whenever the p -value gives a lower value than the alpha value of 0.05 after running Hausman Test, the alternative hypothesis (that prefers the fixed effects model) should be preferred to the null hypothesis that supports the random effects model. As can be observed from Table 5, the p -value (0.1537) is more than the alpha value (0.05). This is why under

the ROA as proxy for profitability the random effects model is used to make inference to turn out data.

4.4.2 Panel Regression Results: ROA as the Dependent Variable

Table 6: Panel Regression Results: ROA as the Dependent Variable

Var	FIXED EFFECTS				RANDOM EFFECTS			
	Coef	Std. Err	t-test	P> t	Coef	Std. Err	z-test	P> z
Constant	14.41	4.701	3.07	0.004	8.280	3.797	2.118	0.029
BFSIZE	0.031	0.275	0.11	0.412	0.249	0.245	1.020	0.007
CAR	-0.084	0.022	-3.84	0.000	-0.077	0.018	4.210	0.001
FUNDRISK	-0.001	0.002	-0.82	0.416	-0.001	0.002	0.310	0.007
CRISK	0.060	0.099	0.60	0.550	0.033	0.101	0.330	0.038
LRISK	-0.770	0.426	-1.82	0.077	-0.147	0.341	0.430	0.060
Diagnostics								
R-squares:								
Wald	-				19.72			
Within	0.3381				0.2948			
Between	0.2400				0.5777			
Overall	0.2881				0.3358			
F-statistic	3.58				-			
p - value	0.0102				0.0014			

Data source: Computation from Bank Financials using STATA 16.1 (2008-16)

* = significant at 10%

** = significant at 5%

*** =significant at 1%

Notes: *Bank Size (BFSIZE), Capital Adequacy Ratio (CAR), Funding Risk (FUNDRISK), Credit Risk (CRISK), Liquidity Risk (LRISK)*

Table 6 gives details of results turned out by STATA 16.1 in studying the relationship between financial sector reform and its effect on bank performance in Ghana. It is realised that an overall R-square score of about 29 percent was made. This explains how the combined strength of the regressor variables in the model (random effects) can influence the dependent variable. Variability in independent variables explains that following the financial sector reform, of the variables selected, their strength or

influence over bank profitability only covers 34 percent. The 66 percent not accounted for is explained by latent variables outside the model. The Wald Test value of 19.72 indicates the relevance of individual variable contribution in the model to explain the effect of financial sector reform on bank profitability. And all these are at less than 1% level of significance. It is notable that using ROA as proxy for bank profitability, the random effect model was found to be the appropriate model. This was made possible by the Hausman Test. Table 5 provides an explanation of how the random effect model was found to be the appropriate model in determining the effect of financial sector reform on bank profitability.

Shifting the focus of the study to the relationship between the dependent variable (ROA) and the regressor variables, it is first observed that the BSIZE had a statistically significant positive relationship with bank profitability proxied by ROA. In their examination of the determinants of bank performance through profitability, Krakah, and Ameyaw (2010) found among others that, bank size is instrumental in determining bank profitability. Corroborating this finding, Adusei (2015) finds larger bank size to have a statistically positive relationship with bank profitability and by protraction helpful to the bank because, increase in bank operations improves profitability. Therefore, efforts to regulate bank size as a means of stabilising the financial sector should be done with caution since these results are in favour of increase bank size. These findings are in-sink with the economic argument about big bank having the ability to promote better asset diversification with the advantage of reducing risk of default and also allows banks to be able to cushion up operations with stabilise funding source and structure (Adusei 2015). Supporting this revelation, Steve (2007) argues that smaller banks are more vulnerable due to their inability to

diversify their assets. He used data from US bank holding companies from 1986 to 2003.

In a differing instance, Carter, and McNulty (2005) found an inverse relationship between bank size and bank net return on business lending. Berger et al (2005) established similar results in their study by emphasising that smaller banks have superior ability to allocate capital to risky borrowers. In their analysis of the relationship between bank size and earnings volatility, Boyd, and Runkle (1993) found that there was a statistically significant inverse relationship between bank size and ROA. Generally, bank-size relationship is expected to be positive if bank asset growth is done with caution. After a certain level of increase in bank size, there is the possibility of diseconomies of scale setting in. Therefore any move by regulatory bodies to place a restriction on bank size should not be seen as a repugnant policy in certain instances.

One of the challenges of banks is loan loss possibility. This is referred to as credit risk, which involves fear of default or fluctuations in debt instruments and derivative valuation which depends on the credit worthiness of borrowers (Loez, & Saidenberg 2005). Using ROA as proxy for bank profitability, CRISK was found to have a statistically significant positive (at 5%) relationship with bank profitability (see Table 6). The sense here is that, with better management practices, fees, interest and commissions charged loans to customers constitute a portion of internally generated income of banks, and by extension will have a positive effect on bank profitability. Kutum (2017) found a positive but weak relationship between credit risk and bank profitability proxied by ROA. Supporting results of Kutum 2017, Hosna et al (2009) revealed a link between credit risk and bank profitability. Studies which found

contrary results include those of Adusei (2015), Almekhlafi et al (2016), Felix, and Claudine (2008), Noman et al (2015), Athanasoglou et al (2005), Kargi (2011), Kaaya, and Pastory (2013), Chimkono, Muturi, and Njeru (2016). Their arguments are seen in the wisdom that the level of bank stability improves with diminished non-performing loans. Jeon, and Lim 2013 (cited in Alharthi, 2016) equally revealed that banks with fewer loans are able to enhance their stability through coverage for clients' withdrawals. This means provision of fewer loans leaves enough liquid for creditor liquid asset needs.

Since bank liquidity is one determinant of bank profitability, it is worthwhile to indicate that bank stability is the function of bank performance in terms of profitability. As such, to avert the issues of insolvency, banks maintain higher liquidity assets which are easily converted into cash (Curak et al 2012). Table 6 has linked liquidity risk negatively to bank profitability (ROA). Banks usually maintain higher liquid assets (lower-loan-to-deposit ratio) to avert the inability to oblige to customer demands. This however reduces potential income generation since fewer funds will be available for investment. The reverse lower liquid maintenance culture has a direct economic implication, thus, more funds will be used to invest but rather exposes the bank to overruns. In other evidenced instances, bank liquidity risk has also been linked positively to bank profitability (Dang, 2011, cited in Ngaira, & Miroga, 2018); Kosmidou, 2008; and Schumacher, 2000). The ratio of liquid assets to customer and short term funding was also positively linked to bank profitability [ROA] (Kosmidou, Tanna, & Pasiouras, 2005). Consolidating this position, Olagunju, David, and Samuel (2012) found a significant positive relationship between bank liquidity and bank profitability and by elongation bank stability.

Other studies that report negative relationship between liquidity risk and bank profitability and by elongation bank stability are those of Molyneux, and Thornton (1992); Sohaimi (2013); Mohammed et al (2018); Khan et al (2017); Tabari, Ahmed, and Emami (2013); and Burke (1989). While this negative liquidity-bank performance hypothesis appears to catch the public eye, there is counter evidence which preaches the need for a trade-off between resilience to bank liquidity shocks and holding cost of less liquid assets (Marozva, 2015). Demircuc-Kunt, and Huizinga (1998) reported mixed results in a study on liquidity risk-performance relationship. Whilst positive relationship was established between liquidity risk and net profit margin, return on internal assets negatively related with liquidity risk.

There was a statistically significant (at 1%) negative coefficient in the case of capital adequacy and its relationship with bank profitability. This revelation fails to agree with findings by Pasiouras, and Kosmidou (2007), who found a positive relationship between banks capital adequacy and bank profitability thereby less exposed to bankruptcy. Other studies who established that banks with higher levels of capital perform better than their counterparts who are less capitalised include those of Staikouras, and Wood (2003) who posit that greater equity is positively related to bank profitability when they studied EU banks. Abreu and Mendes (2001) equally trace higher equity capital to positive profitability. Contrary to studies which found positive relationship between capital adequacy and bank profitability, Ali et al (2011) identified that bank profitability is inversely related with capital when they studied Pakistani banks using ROA as a proxy of bank profitability. This revelation was made when they examined the determinants of profitability performance in the Pakistani bank industry between 2006 and 2009. In the case of Al-Tamimi (2006) he studied the determinants of commercial banks' performance in the United Arab Emirates and

found that bank capital inversely impacted bank performance in terms of profitability. In a similar research, Kundid (2012) realises that higher capital adequacy negatively impacted profitability.

Banks have in many instances struggled to find funds for operations of any kind comparable difficulty. Funding risk has been identified as one challenge that has stifled bank performance in the industry. In studying the effect bank reform has on bank performance, this study under the tutelage of ROA has identified FUNDRISK to have a statistically negative relationship with profitability. In a corroborative fashion, Adusei (2015) linked FUNDRISK positively to bank profitability. This risk has virtually been on holiday in risk analysis. In this study what our results show explain that, as funding risk improves, profitability increases and vice versa.

4.4.3 Panel Regression Results: ROE as the Dependent Variable

Similarly, multiple regression analysis was used to determine how the financial sector reform measures affect bank profitability. In this second department, return on equity (ROE) is used as proxy for bank profitability. Again here, the Hausman Test was used to settle on the appropriate model to be used (see Table 7).

4.4.4 Hausman Test (Model II for ROE)

Table 7: Hausman Test (Model II for ROE)

Var	Coefficient			
	(b) Fixed	(B) Random	(b-B) Difference	sqrt (diag(V_b-V_B)) S.E
Bsize	-0.132	40.877	-41.009	0.677
CAR	3.056	6.396	-3.340	-
FUNDRISK	3.735	-4.381	8.116	1.876
CRISK	-0.049	4.312	-4.361	-
LRISK	3.565	30.567	-27.002	0.169

Data source: Computation from The Hausman Test (2020)

b=consistent under H_0 and H_a ; obtained from xtreg

B=inconsistent under H_a ;efficient under H_0 ;obtained from xtreg

Test: H_0 difference in coefficient not systematic

$$\begin{aligned} \text{chi}^2(5) &= (b-B)' [V_b - V_B]^{-1} (b-B) \\ &= 25.34 \end{aligned}$$

Prob> $\text{chi}^2 = 0.0011$

($V_b - V_B$ is not positive definite)

Table 7 gives details of the results obtained from the Hausman Test. Comparing the fixed and random effects results from Table 7, the Hausman technique identified the fixed effect model as the appropriate model capable of explaining the relationship between dependent and independent variables. A p - value of 0.0011 was obtained which satisfies the principle for the adoption of the fixed effect as the value was less than the alpha value of 5% (Prob> $\text{chi}^2=0.0011$).

Table 8: Panel Regression Results: ROE as the Dependent Variable

Var	FIXED EFFECTS				RANDOM EFFECTS			
	Coef	Std. Err	t-test	P> t	Coef	Std. Err	z-test	P> z
Constant	2.049	1.441	-0.034	0.974	30.785	11.781	2.613	0.398
BFSIZE	-0.132	1.230	-0.127	0.025	40.877	7.388	5.533	0.003
CAR	3.056	1.201	2.545	0.004	6.396	1.166	5.485	0.546
FUNDRISK	3.735	1.255	2.975	0.007	-4.381	0.702	-6.241	0.092
CRISK	-0.049	0.112	-0.438	0.000	4.312	0.366	11.781	0.038
LRISK	3.565	1.129	3.158	0.006	3.567	0.341	10.460	0.060
Diagnostics								
R-squares:								
Wald	-				104.92			
Within	0.5288				0.4606			
Between	0.0691				0.8783			
Overall	0.3097				0.6256			
F-statistic	7.44				-			
p - value	0.000				0.0020			

Data source: Computation from Bank Financials using STATA 16.1 (2008-16)

* = significant at 10%

** = significant at 5%

*** =significant at 1%

Notes: *Bank Size (BSIZE), Capital Adequacy Ratio (CAR), Funding Risk (FUNDRISK), Credit Risk (CRISK), Liquidity Risk (LRISK)*

The regression analysis results for ROE using the fixed effects model are captured on Table 8. The results for the R^2 (overall) shows a figure of about 31 percent. What it explains is that, the dependent variable (ROE) has 31 percent of its influence from the selected regressor variables in the model. The 69 percent that is unexplained in the model is being determined by other external factors that have not been incorporated into the model. In effect, the financial sector reform measures instituted in respect of the regressor variables used in this study can only influence bank profitability (ROE) by 31 percent. There are other variables in the financial system that also influence bank profitability for which this study did not capture although the reform policy affected them.

Bank size-profitability test has gained enormous consideration across the globe. Whereas some think bigger banks are more preferable to smaller banks due to the advantage of economies of large scale operation which brings higher profits (Kořak & Āok 2008); Kosmidou (2008); and Pervan et al (2010) result from Table 8 contradicts this postulation. It is established that, BSIZE has a statistically inverse relationship with bank profitability under ROE. Besides, a study in Ghana by Adusei (2015) on community and rural banks' profitability reports yet another opposing opinion as it found a positive statistically significant relationship with bank profitability. Supporting the findings in this study on size-profitability, Haan, and Poghosyan (2012) note that the relationship between bank size and bank profitability is non-linear; this is so because, after a certain level of growth, bank size positively impacts

return volatility (Kořak & Āok, 2008, cited in Adusei, 2015). It is also explained in favour of the negative results from Table 8 on size-profitability, the agency theory argues that managers only work to increase firm size to their selfish interest, as they receive huge salaries and other insider derivative trading. Another set of studies that provided evidence to support the negative relationship between bank size and bank profitability are those of Sufian et al (2004); and Ben et al (2008).

Adusei (2015) reports in his study of rural and community banks' profitability that return-risk hypothesis predicts that each time the bank's loan-to-asset ratio is higher, then such a bank is much exposed to instability. The results on Table 8 show a contrary picture as it reports a statistically significant negative relationship between bank credit risk and bank profitability proxied by ROE. With this development, a decrease in risky loans potentially pushes profits high as the default rate is comparatively reduced. In the case of Kargi (2011), he observed that credit risk has an inverse relationship with bank profitability, which is directly in-sink with results on Table 8 about credit risk-profitability relationship. Another supportive result was revealed by Kaaya et al (2013) when they studied Tanzanian banks' profitability determinants. They concluded that credit risk-profitability is inversely correlated with bank performance. Interestingly enough, Tan and Floros (2012) showed an evidence of negative relationship between bank credit risk and bank profitability, in their study of Chinese banks. Other contracting results were produced by a study conducted in Sub-Saharan African 41 countries by Flamini et al (2009), when they declared that bank credit risk is positively related to bank profitability. Kolapo et al (2012) are among authors who established that credit risk rather positively correlates with bank profitability in their paper on credit risk management in Nigeria.

As one of the specific objectives, the research sought to establish the effect of liquidity risk on bank performance in terms of profitability. Liquidity risk reflects the tendency that a bank might not be able to satisfy the demands of customers in the short period. Going by results on Table 8, liquidity risk is found to have a statistically significant positive impact on bank profitability. This resonates with the hypothesis that maintaining higher levels of liquid assets in the bank safes the bank from insolvency. Adusei (2015) results are in line with those obtained on Table 8 as he established a statistically significant positive relationship between liquidity risk and bank profitability (ROE). Other set other studies think maintaining higher liquidity saves the bank better from instability issues (Curak et al, 2012). Bourke (1989) equally found some evidence of a positive relationship between liquidity risk and bank profitability when he studied 90 banks in Europe, North America and Australia between 1972 and 1981. However, Molyneux, and Thornton (1992); and Goddard et al (2004) produced mixed evidence of any such negative relationship between those two variables for European banks in late 1980s and mid-1990s respectively.

In a similar development, a paper by Berger (1995) brought up a model analysis where he sought to statistically establish the relationship between bank earnings and its capital for US banks over the period of 1983 and 1989. He notes that, contrary to the widely held notion with symmetric information, there is a positive relationship between capital and return on equity (ROE). Sufian, and Habibullah (2009) have documented their evidence to the effect that bank capitalisation has a positive impact on bank profitability. This came up when they studied the determinants of bank profitability in China. These findings are in tandem with result from Table 8 that reports a statistically positive relationship between bank capitalisation and bank profitability. Earlier studies of Goddard et al (2004) posit that higher capital adequacy

maintenance by a bank means overly being cautious to the neglect of profitable ventures and trading opportunities. This implies that capital adequacy; according to them has an inverse relationship with bank profitability.

Funding risk is one of the variables that this study controls for. Table 8 finds that FUNDRISK has a statistically positively relationship with bank profitability. Adusei (2015) however reported a contrary result when he established that FUNDRISK has a statistically robust negative relationship with bank profitability under ROE. The findings from Table 8 indicate that as the FUNDRISK improves, profitability shoots up. As more funding avenues are opened, profitability is expected to increase all things beings possible. However, when customer deposits improve, banks are usually motivated to create money in the system.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This part of the study summarises what is dealt with in the thesis, draws conclusion on the major findings and makes recommendations for policy and further research.

5.2 Summary

The study set out to assess financial sector reform measures in Ghana and how they affect bank performance in terms of profitability. To successfully achieve this general objective, the study utilised three specific objectives; to determine the effect of bank size on bank performance; to establish the relationship between credit risk and bank performance and finally; to evaluate the effect of liquidity risk on bank performance. This was made possible by collecting secondary data from nine banks' websites between 2010 and 2018. A descriptive design was used. It was found that under ROA, bank size and credit risk had a statistically positive relationship with bank profitability using the random effects model. Liquidity risk had a negative relationship with bank profitability. Under ROE where the fixed affects model was used, bank size and credit risk related negatively with bank profitability. Only liquidity was founder under this profitability proxy to have a positive correlation with profitability. The study concludes that all the specific objectives contribute substantially in determining bank profitability and therefore should be accorded best management policies.

5.3 Major Findings

5.3.1 Effect of Bank Size on Bank profitability

The effect of bank size on bank profitability was done using two profitability proxies; ROA and ROE. Under the ROA, bank size was found to have a statistically positive relationship with ROA at 5% significance. In the case of bank size-ROE relationship, it was directly the opposite. Bank size had a statistically significant negative relationship with ROE. Under the ROA, positive bank size relationship means with increase in assets, operational and transaction costs per unit will be reduced as management will have an urge in bargaining for contracts. In the case of ROE, expansion in size beyond a certain level could invite diseconomies of scale.

5.3.2 Effect of Credit Risk on Bank Profitability

Another specific objective of the study was the effect of credit risk on bank profitability. Again under profitability ROA and ROE were use as measures of bank profitability. And so under the ROA, the study reported a statistically significant positive relationship between credit risk, measured as total loans to total assets and profitability. This means with an improvement in credit default rate, there will be an increase in profit levels for an average bank. In the case of ROE and credit risk relationship, the study revealed a significant negative link. This re-echoes the fact that as bad debts turn good, banks will be able to increase earnings thereby improving profitability.

5.3.3 Effect of Liquidity Risk on Bank Profitability

Whereas liquidity risk was found to inversely relate with profitability under ROA, it recorded a direct opposite results under ROE as a profitability proxy. The policy

implication here is that, under ROA management will have to work their way to improve more funding to the satisfy customers any time credits fall due. Maintaining less liquid assets is ideal to safe the bank the benefit of earning high interest on investment. But this will also deprive the bank from being able to oblige readily to customer demands. It was realised that under ROE, liquidity risk was in favour of maintain more liquid assets to protect the bank from default should customers demand their deposits.

5.4 Conclusion

The general object of this study was to assess the effect financial sector reform has on bank performance in Ghana. It was realised from the major findings that under both the random and fixed effects models, the specific objectives related differently with the dependent variable (bank profitability). As such, the behaviour of a particular variable on the dependent variable is dependent on management policy implementation and execution. Since the regressor variables behave differently under different conditions, management should come to terms with the reality that all regressor variables play important roles in determining bank profitability and so by this observation; it is relevant that, especially bank size could be allowed to expand but cautiously. In the case of credit risk, it must be taken seriously to stabilise the bank since it behaves differently under different profitability measures as in the case of other regressors.

5.5 Recommendations

Following revelations from the major findings, this study makes a brief recommendation on specific objectives.

Management should be cautious in expanding through opening of branches of banks since it can increase initial capital and research and development cost thereby inviting diseconomies of scale. This could be done by ensuring that internal funding mechanisms are put in place for branch expansion. Also, since literature has it that the global financial crisis was partly blamed on big bank size, overly increasing bank size could be as good as being a prey for bankruptcy and must be done with extreme caution.

Banks should generally have a threshold for lending out funds to customers. Single obligor limits should be set on Individual persons as excessive lending could trigger counterparty crisis. This notwithstanding, management should ensure effective monitoring and supervision by creating specific portfolio to guarantee repayment of loaned funds.

The Basel III recommendation on holding 90-100 liquidity needs of customers by every bank at a particular time to avert the issue of disappointing customers when credit payments fall due should be adhered to without hesitation. Banks can also make good use of short term investment opportunities by holding less liquid assets to enable them enjoy interest and commission income.

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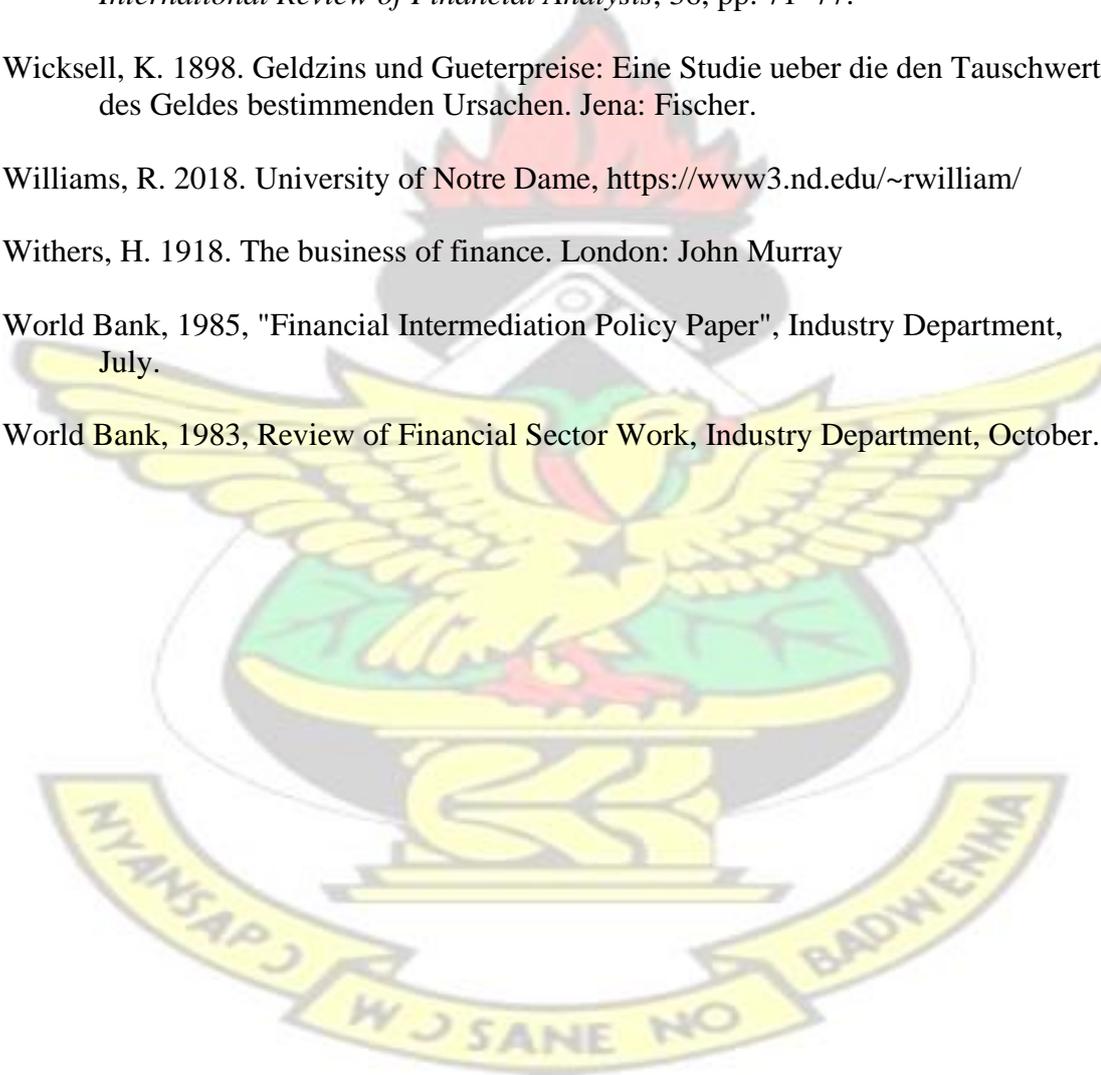
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APPENDICES

```
. xtreg ROA SIZE CAR FUNDRISK CRISK LRISK, fe
Fixed-effects (within) regression      Number of obs   =    81
Group variable: LISTED                Number of groups =    9
R-sq:                                Obs per group:
    Within = 0.3381                    min =          9
    Between = 0.2400                   avg =         9.0
    Overall = 0.2881                   max =          9
                                F(7, 33) =    3.58
corr (u_i, Xb) = -0.0228                Prob > F =    0.0102
```

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SIZE	.0312612	.2745378	0.11	.412	-.0122039	.0096816
CAR	-.0841903	.0217973	-3.84	.000	-.0073468	.0081045
FUNDRISK	-.0010152	.0021911	-0.82	.416	-.1243460	.0423829
CRISK	.06019311	.0099221	0.60	.550	-.0007204	.0003342
LRISK	-.0774033	.4263334	-1.82	.077	-.0022814	.011288
_cons	14.4097	4.70556	3.07	.004	-.0338166	.2532791

```
sigma_u | .01110723
sigma_e | .02223016
rho | .1997739 (fraction of variance due to u_i)
```

F test that all u_i=0: F(4, 33) = 0.97 Prob > F = 0.4380

```
. estimates store Fixed
```

```
. xtreg ROA SIZE CAR FUNDRISK CRISK LRISK, re
```

```
Random-effects GLS regression      Number of obs   =    81
Group variable: LISTED            Number of groups =    9
```

```
R-sq:                                Obs per group:
    within = 0.2948                    min =          9
    between = 0.5777                   avg =         9.0
    overall = 0.3358                   max =          9
```

Wald chi2(7) = 19.72
 corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.0014

ROA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
SIZE	.2488454	.245378	1.020	0.007	-.0154621	-.0006287
CAR	-.0769082	.017552	4.210	0.001	-.005971	.0079526
FUNDRISK	-.0012322	.001834	0.310	0.007	-.1465061	-.0099583
CRISK	-.0331182	.1012098	0.330	0.038	-.0005995	.0002227
LRISK	-.1468427	.3411878	0.430	0.060	-.0044253	.0061107
_cons	8.270322	3.796674	2.118	0.029	.0651129	.2875363

sigma_u | 0
 sigma_e | .02223016
 rho | 0 (fraction of variance due to u_i)

. estimates store Random

. hausman Fixed .

Coefficients				
	(b) Fixed	(B) Random	(b-B) Difference	sqrt (diag (V_b-V_B)) S.E.
SIZE	0.031	0.249	-0.218	0.282
CAR	-0,084	-0.077	-0.007	-1.210
FUNDRISK	-0.001	-0.001	0.000	0.001
CRISK	0.060	0.033	0.027	0.034
LRISK	-0.077	-0.147	0.623	0.430

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(5) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 10.03 \\ \text{Prob}>\text{chi2} &= 0.1537 \end{aligned}$$

```

. xtreg ROA SIZE CAR FUNDRISK CRISK LRISK, fe
Fixed-effects (within) regression      Number of obs   =   81
Group variable: LISTED                Number of groups =    9
R-sq:                                Obs per group:
    Within = 0.5288                    min =          9
    Between = 0.0691                   avg =         9.0
    Overall = 0.3097                   max =          9
                                         F(5, 33)      =    7.44
corr (u_i, Xb) = -0.0228                Prob > F       =    0.000

```

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SIZE	-0.132612	1.230	-0.034	0.025	-.0122039	.0096816
CAR	3.056419	1.201	2.545	0.004	-.0073468	.0081045
FUNDRISK	3.724612	1.255	2.975	0.007	-.1243460	.0423829
CRISK	-0.048811	0.112	-0.438	0.000	-.0007204	.0003342
LRISK	3.564774	1.129	3.158	0.006	-.0022814	.011288
_cons	2.048649	1.441	-0.034	0.974	-.0338166	.2532791

```

sigma_u | .01110723
sigma_e | .02223016
rho | .1997739 (fraction of variance due to u_i)

```

```

F test that all u_i=0: F(4, 33) = 0.97      Prob > F = 0.4380

```

```

. estimates store Fixed

```

```

xtreg ROE SIZE CAR FUNDRISK CRISK LRISK, re

```

```

Random-effects GLS regression      Number of obs   =   81
Group variable: LISTED            Number of groups =    9

```

```

R-sq:                                Obs per group:
    within = 0.4606                    min =          9
    between = 0.8783                   avg =         9.0
    overall = 0.6256                   max =          9

```

```

                                         Wald chi2(5)    =   104.92
corr (u_i, X) = 0 (assumed)           Prob > chi2     =    0.002

```

ROE	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
-----	-------	-----------	---	------	----------------------

SIZE	40.87714	7.388	5.533	0.003	-.0154621	-.0006287
CAR	6.39609	1.166	5.485	0.546	-.005971	.0079526
FUNDRISK	-4.38078	0.702	-6.241	0.092	-.1465061	-.0099583
CRISK	4.32150	0.366	11.781	0.038	-.0005995	.0002227
LRISK	3.56784	0.341	10.460	0.060	-.0044253	.0061107
_cons	30.77632	11.781	2.613	0.398	.0651129	.2875363

sigma_u	0					
sigma_e	.02223016					
rho	0	(fraction of variance due to u_i)				

. hausman Fixed .

----- Coefficients -----				
	(b) Fixed	(B) Random	(b-B) Difference	sqrt (diag (V_b-V_B)) S.E.
SIZE	- 0.132	40.877	-41.009	0.677
CAR	3.056	6.396	-3.340	-
FUNDRISK	3.735	-4.312	8.116	1.8876
CRISK	-0.049	4.312	-4.361	-
LRISK	3.565	30.567	-27.002	0.169

Data source: Computation from The Hausman Test (2020)

b=consistent under H_0 and H_a ; obtained from xtreg

B=inconsistent under H_a ;efficient under H_0 ;obtained from xtreg

Test: H_0 difference in coefficient not systematic

$$chi^2 (5) = (b-B)' [V_b-V_B]^{-1} (b-B)$$

$$= 25.34$$

Prob> $chi^2 = 0.0011$

(V_b-V_B is not positive definite)

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