

**COLLEGE OF HUMANITIES
UNIVERSITY OF GHANA BUSINESS SCHOOL**

**DETERMINANTS OF BANK RISK IN GHANA: ARE THERE DIFFERENCES
BETWEEN LOCAL AND FOREIGN BANKS?**

BY

ZISSE RICHARD NUTSUGLO

(10336742)

**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPhil
RISK MANAGEMENT DEGREE**


JULY 2019

INTEGRI PROCEDAMUS

DECLARATION

I, hereby declare that this submission is my own work towards the award of the MPhil (Risk Management and Insurance) degree and that to the best of my knowledge does not contain material previously published by another person nor material submitted for the awarding of any other degree of the university, except where due acknowledgments had been made in the text.

Any flaws found in this research are solely my responsibility.

Candidate's Signature: 

Date: 01/10/2020

Zisse Richard Nutsuglo

(10336742)

CERTIFICATION


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

First Supervisor's Signature:
(Prof. Joshua Yindenaba Abor)



Date: 8/10/2020

Second Supervisor's Signature:
(Dr. Elikplimi Komla Agbloyor)



Date: 5/10/2020.

I dedicate this work to the reader. In all things worth doing, try as much as possible to stay focused.

Never Quit, Never Give Up.

ACKNOWLEDGEMENTS

My utmost acknowledgement goes to the Almighty God, for granting me the strength and grace to persevere throughout the course of my MPhil studies. May His name forever be praised. I also express sincerest gratitude to Professor Joshua Abor and Dr Elikplimi Komla Agbloyor for their expert advice and guidance which helped me to complete this thesis.

To my friends and family who have been my backbone throughout the course of my academic life, I say, may God continue to bless us, keep us safe, and may we forever enjoy the fruits of our toils.

LIST OF TABLES

Table 3. 1 Data Sources	28
Table 4. 1 Summary Statistics of Ghanaian Banks.....	40
Table 4.3 1 Correlational Matrix of Explanatory Variables	41
Table 4.3.2 1 Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity	42
Table 4.3.2 2 Wooldridge test for autocorrelation H0: no first order autocorrelation.....	43
Table 4.3.2 3 Hausman Test results	44
Table 4.3.2 4 Breusch-Pagan Test results	44
Table 4.4. 2 Tab Regression Results of Impact of FINC, NDEPF on Bank risk.....	46
Table 4.4. 3 Regression Results of Impact of Corporate Governance on Bank Risk.....	49
Table 4.4. 4 Regression Results of Impact of Interaction Between Fee and Commission Income and Non-Deposit Funding on Bank Risk	51
Appendix 1: List of Both Local and Foreign Banks Considered in The Study	69
Appendix Table 2: Variance Inflation Factor	70
Appendix Table 3: Shapiro- Wilk W test for normality	71

LIST OF FIGURES

Figure 1 Dynamics in Fees and Commission Income, Local (left) vs Foreign (Right)..... 72

Figure 2 Dynamics in Non-Deposit Funding: Local (Left) vs Foreign (Right)..... 73

Figure 3 Dynamics in Return on Assets: Local (Left) vs Foreign (Right) 74

LIST OF ABBREVIATIONS

FINC:	Fees and Commission Income
NDEPF	Non-Deposit Funding
CAR:	Capital Asset Ratio
ROA:	Return on Asset
GDP:	Gross Domestic Products
BODSIZE;	Board Size
NONEXEC:	Non-Executive Members of Board
BODGEN:	Board Gender
CEODUA:	Chief Executive Office (Managing Director and Board Chairman)
AUDITOR:	Banks with External Auditors Among the Top Four Auditing Firms

ABSTRACT

This research examined, among other factors, the impact of the changing bank income generation activities on bank risk, how other types of bank funding strategies affect bank risk and the role of Corporate Governance on bank risk. It also examined whether these factors are significantly different between local and foreign banks in Ghana. A review of the financial sector, specifically, the banking sector in Ghana, indicates that more locally owned banks often collapse over time. Academic discussions and research about bank risk have considered some factors that are believed to influence bank risk such as ownership structures and income diversification. However, these studies often have results and findings which are divergent in views, on the extent or levels at which these variables affect bank risk.

The study employed panel regression model with Breusch-Pagan Test for Heteroscedasticity and Wooldridge test for autocorrelation to examine how Fees/Commission Income (FINC), which is income generated from non-traditional activities of banks, Non-Deposit Funding (NDEPF) of bank activities by capital other than customers deposit, and Corporate Governance variables impact on the risk of banks in Ghana. Results of the study showed a significant positive relationship between NDEPF bank stability for banks in Ghana. Again, the findings showed that whiles Corporate Governance variables such as Board Gender ratio had a positive significant relationship for bank stability and profitability in Ghana. The interaction of FINC and NDEPF had a significant negative relationship on bank risk for banks in Ghana. With all conditions held constant, locally owned banks are riskier than foreign owned banks.

TABLE OF CONTENTS

DECLARATION	i
CERTIFICATION	ii
DEDICATION	Error! Bookmark not defined.
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	vii
ABSTRACT	viii
TABLE OF CONTENTS	ix
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background of Research	1
1.2 Research Problem	4
1.3 Research Objectives	6
1.4 Research Questions	6
1.5 Research Scope	6
1.6 Significance of Research	7
1.8 Outline of Chapters	7
CHAPTER TWO	9
LITERATURE REVIEW	9
2.1 Introduction	9
2.2 Ghanaian Banking Industry	9
2.3 Bank Risk	11
2.3.1 Credit Risk	12
2.3.2 Liquidity Risk	13
2.3.3 Market Risk	13
2.4 Ownership Structure	14

2.5 Dynamics in Banking Activities	16
2.6 Changing Trends in Bank Funding	18
2.7 Corporate Governance.....	19
2.8 Conceptual Framework	21
2.9 Theoretical Framework	22
2.9.1 Information Asymmetry Theory.....	22
2.9.2 Theory of Persistency of Profits (POP)	23
2.9.3 Agency Theory	24
2.10 Contribution to Literature.....	25
2.11 Chapter Summary.....	25
CHAPTER THREE	27
METHODOLOGY	27
3.1 Introduction.....	27
3.2 Research Design.....	27
3.3 Data Issues.....	28
3.4 Sources of Data	28
3.5 Model Specification	29
3.5.1 Model 1.....	29
3.5.2 Model 2.....	29
3.5.3 Model 3.....	29
3.6 Description of Variables.....	30
3.6.1 Dependent Variables (Z-SCORE)	30
3.6.2.1 Bank Activity, Fee and Commission Income (Finc)	31
3.6.2.2 Bank Funding strategy; Non-Deposit Funding (NDEPF)	32
3.6.2.3 Ownership.....	32
3.6.3 Corporate Governance.....	33
3.6.3.1 Board Size (BODSIZE).....	33
3.6.3.2 CEO Duality (CEODUA).....	33
3.6.3.3 Non-Executive Directors (NONEXEC)	34
3.6.3.4 Board Gender (BODGEN)	35
3.6.3.5 Auditors (AUDITOR).....	35
3.7 Control Variables	36
3.7.1 Size	36
3.7.2 Capital Asset Ratio	36

3.7.3 Return on Asset	37
3.7.4 Gross Domestic Product	37
3.8 Conclusion.....	38
CHAPTER FOUR.....	39
RESULTS AND DISCUSSION	39
4.0 Introduction	39
4.1 Descriptive of Summary Statistics	39
4.2 Diagnostic Test.....	42
4.3.1 Testing for Multicollinearity of Explanatory Variables	42
4.3.2 Serial Correlation and Heteroskedasticity	42
4.3.2.1 Heteroscedasticity.....	42
4.3.2.3 Hausman Test for Random Effect versus Fixed Effects.....	43
4.3.2.4 Breusch-Pagan LN Test for Random Effect versus OLS	44
4.4 Regression Results and Discussion	45
4.4.1 Comparative Regression Analysis for Both Local and Foreign Banks	45
4.4.2 Fee and commission Income, Non-Deposit Funding and Bank Risk.....	46
4.4.3 Corporate Governance and Bank Risk	48
4.4.4 Interaction of Fee and Commission Income and Non-Deposit Funding on Bank Risk	50
CHAPTER FIVE	52
SUMMARY, CONCLUSION AND RECOMMENDATION	52
5.1 Introduction	52
5.2 Summary of Findings	52
5.3 Conclusion.....	55
5.4 Recommendations	56
REFERENCES	58
APPENDICES	69
Appendix 2: Testing for No Multicollinearity of Variables.....	70
Appendix 4: Normality Test.....	71
Appendix 5: Changing Trends in Fees and Commission Income: Local (Left) vs Foreign (Right)	72
Fig. 1. Trend of the fee income share	72
Appendix 6: Changing Trends in Non-Deposit Funding: Local (Left) vs Foreign (Right)	73

Fig. 2. Trend of the non-deposit funding share	73
Appendix 7: Changing Trends in Return on Asset: Local (Left) vs Foreign (Right)	74
Fig. 3. Trend of the Return on assets.	74

CHAPTER ONE

INTRODUCTION

1.1 Background of Research

Bank crisis in any economy, be it developed, emerging or developing can spell doom for the financial sector of that country. Bank crisis with its contagion effect to all industries both private and public in the financial sector of an economy has been shown from literature to be caused by several factors such as and not limited to financial industry deregulations, macroeconomy downturn, poor/mismanagement of financial firms, irrational investor behaviours, bank revenue diversification and market competition between local and foreign banks among other factors (Ballester, Casu, & González-Urteaga, 2016). The efficiency of an economy's banking sector is very vital to spur its economic growth. Hence, the stability of the banking industry, in any country, is a fundamental requirement (Amuakwa-Mensah & Boakye-Adjei, 2015). Therefore, banks are required to remain viable and efficient as much as possible, ensuring performance and stability.

In almost every economy of the world, the banking industry is made up of both local and foreign owned banks though in varying proportions due to economic liberalisation and an increase in the level of financial integration into the financial system (Adjei & Chakravarty, 2012; Lengwiler & Maringer, 2015). Financial markets deregulation coupled with the internationalization of the financial industry by the penetration of foreign bank is known to influence market competition leading to growth in the sector (Bouzgarrou, Jouida, & Louhichi, 2018) by promoting exchange strategies, models and adaption of technological advances promoting interdependency in domestic banks especially from foreign players in the industry. However, the involvement of these foreign banks in the domestic economies, be it in terms of strategic policies, operational models adopted by these foreign banks in their host countries, can have a significant influence on the local economy

including causing financial crisis. This is supported by studies by Narwal & Pathneja, (2016); Doan, Lin, & Doong, (2018); Haider et al., (2018). In the Gulf Cooperation Council region, where ownership structure of banks are concentrated significantly by government, domestic institutional, or family membership, banks are less affected by global financial crisis (Ashraf, Ramady, & Albinali, 2016).

Underlying problems and challenges in a banking system are exposed when financial crisis occurs and most often, these problems are associated with banking models such as Ownership Structures and Corporate Governance Systems or Diversification of income generating activities, among other causes. The recent Global Financial Crisis, which happened in 2007 – 2008, shed more light on the changing structures of bank income generation activities and funding strategies and also the challenges of corporate governance and ownership structures in the banking industries of most developed and emerging economies (Stiroh, 2004; Demirguc-Kunt & Huizinga, 2010; Bokpin, 2013; Haque & Shahid, 2016).

Banking activities (i.e. income generating activities or business) traditionally generate income and profit from the business of making loans to their customers though there exist other activities of generating income and profits which are usually non-traditional such as bancassurance, etc. In the U.S. banking industry, bank income generation activities had steadily shifted far from traditional sources of income such as lending and moved towards non-traditional income-generating activities such as service fees, trading income, (Stiroh, 2004). Other non-interest earnings forms such as insurance, securities underwriting, brokerage, and fiduciary services (Sawada 2013). To better improve the performance of banks and make them more profitable, banks begun diversifying into other lines of businesses because diversification is opined to be a means to enhance profitability and efficiency in operations of banks when their scale and scope of operation widens (Özek, 2017;

Doan et. al, 2018). However, diverting into other income generating banking activities presents its own challenges and risks. Many authors opine the non-interest income generation activities, though often believed to enhance profitability gains, also have higher risk since they are unstable naturally (Lepetit et al., 2008; Köhler, 2014; Meslier, Tacneng, & Tarazi, 2014; Doan et. al, 2018; Moudud-Ul-Huq, et. al, 2018).

Most developed and emerging economies generally are faced with several factors such as underdeveloped and illiquid stock markets, dependent on financial markets, economic uncertainty, poor investor protection, rampant government interference and prevalence concentrated shareholding and ownership control (Tsamenyi et al., 2007) and these factors can affect how bank funds are structured (Curi et al., 2015). Norden & Weber (2010) provide evidence of most banks in Germany having their source of funding from interbank borrowing as deposits from customers decrease over 1992-2002. Again, Demirgüç-Kunt & Huizinga (2010), opined that bigger and fast-growing banks often have higher shares of non-deposit funding relative to customers deposits.

A look at the banking sector in Ghana shows that more locally owned banks keep collapsing over time and in the late 1970s and early 1980s, poor macroeconomic factors led to massive failures within the locally-owned domestic banks than in foreign banks, highlighting their pervasive internal inefficiencies (Anin, 2000; Appiah,2001; Bokpin, 2013). This research therefore seeks to investigate distinguishable determinant factors of bank risk for both locally owned and foreign owned banks in Ghana. The research focuses on the Ghanaian banking industry and investigates the impact of non-traditional banking activities and funding structures of banks.

1.2 Research Problem

Domestic local banks are often disadvantaged in the financial sector upon the entry of foreign banks since both foreign and locally owned banks operating in the same given domestic economies are exposed to same challenges but foreign banks have multinational parent companies that can always provide extra resources in favour of attaining a competitive advantage (Ghosh, 2016). And the entry and exist of foreign banks are known to drive profits to zero which significantly affect domestic local banks (Amidu, & Harvey,2016; Gugler, & Peev, 2018). This critical factor notwithstanding, most research related on performance, profitability and risk of banks often view banks operating in the same economy as exposed to same challenges and also equal in terms of resources which has been shown not to be the case in most studies, (Lensink & Hermes 2004; Xu ,2011; Bouzgarrou, et al. 2018). Hence a theoretically gap in the way differences in bank ownership are studied.

Most of these research works are based on data from developed economies, with only few from developing economies like those in Africa and Ghana to be specific. Literature on bank risk taking in Ghana, such as Kuranchie-Pong, Bokpin, & Andoh, (2016) considered disclosure as a measure for bank risk unlike Z-score which was used by other authors. Again, Apanga, Appiah, & Arthur (2016) opined that factors such as role of board of directors has an influence on the credit risk of banks. Adzobu, Agbloyor, & Aboagye, (2016) studied variables such as diversification in loan portfolios. Also, Sissy, Amidu, & Abor (2017) suggested with evidence that, cross-border banking and revenue diversification had an effect on banks risk and returns. These few cited researches though considered factors similar to the ones which are used in this study employed data from pre-financial crisis of 2008 (Bokpin & Arko, 2009; Pennathur, Subrahmanyam, & Vishwasrao, 2012). and often did not. The distinguishing value this studies is that it employs the Z-score as the

dependent variable and utilises data from both pre financial crisis in the 2008 period and complete available bank level and macroeconomic data gathered after the global financial crisis further 2015, provide new insights into the changes in the banking sector of Ghana pre-global financial crisis and post financial crisis as at time of the study. Also, this research seeks to contribute to literature to bridge the context gap found in bank funding strategies and income diversification literature in then Ghanaian context.

Both Academic and industry research and discussions on bank risk have often considered some factors such as ownership structures and corporate governance (Stiroh, 2004; Acharya, Hasan, & Saunders, 2006; Demircuc-Kunt & Huizinga, 2010; Meslier et al., 2014). Bokpin, (2013) bank risk-taking and ownership structure and suggested that ownership type of banks affects bank risk, however, that study analysed efficiency measures using panel data from the period 1999-2007 on the Ghanaian banking industry. These extant studies and literature have been advancing over some decades now, however, results and findings are often divergent in views and inconclusive. As such, researchers often argue about variables which can have significant impact on bank risk and are worthy to be studied.

There is, therefore, the need for a comparative study on the determinants of bank risk in Ghanaian banks, comparing between both local and foreign owned banks and considering how bank level variables may have changed after the recent financial crisis of 2008 employing data gathered years after the 2008 global financial crises and how these changes and trends could affect bank risk. This research considers among other factors, the role of Corporate Governance on bank risk, the impact of changing bank income generation activity on bank risk, how other types of bank funding strategies affect bank risk and whether these factors are significantly different between local and foreign banks in Ghana.

1.3 Research Objectives

This research seeks to examine the factors that significantly impact bank risk in the Ghanaian banking industry. The specific objectives of the research are:

1. To determine effects of banking activities and funding strategies on bank risk.
2. To determine the effects of corporate governance on bank risk, comparing ownership types.
3. To determine if banking activities interact with funding strategies to impact on bank risk.

1.4 Research Questions

The following questions serve as a guide to achieving the research objectives.

1. Which type of banking activities and form of funding strategies have effects bank risk?
2. How much does corporate governance influence bank risk, comparing ownership types?
3. Does banking activities interact with form of funding strategies to impact on bank risk?

1.5 Research Scope

The research scope is the Ghanaian banking industry, with specific emphasis on locally owned and foreign owned banks. The research is focused on the banking market of Ghana for two main reasons. First, Ghana is chosen because is held up as a star in the sub-Saharan African reforming economy, by external agencies such as the World Bank and the International Monetary Fund (IMF) (Aboagye & Ahenkora, 2017). Although Ghana is only the second largest economy in the ECOWAS bloc behind Nigeria, unlike the Nigerian banking industry, the central bank of Ghana only issues universal banking licenses to registered banks while Nigeria has different types of banks (Bello Dogarawa, 2011; Ajibo, 2015) and as such, this makes the Ghanaian banking sector

a peculiar case to research. The distribution of types of banks in Africa is skewed and may influence the riskiness of African banks and their use to make generalisations, especially in relating to Ghanaian banks (Ansah-Addo, 2015).

1.6 Significance of Research

Findings from this research presents implications for the regulators of banks, shareholders and bank managers in Ghana. First of all, this research will provide insight into how Ghanaian banks may benefit from the funding strategies of banks in order to help in the reduction of bank risk. Again, findings about the impact of changing bank income generating activities on bank risk and levels at which these impacts are observed can help Ghanaian banks derive maximum satisfaction from bank activity diversification. Cues from this research will help banks in planning their activities; either to increase incomes generated from their loan portfolio or from other non-traditional banking sources. New literature arguments for academic discourse and industry reviews on bank activities, bank funding strategies, local ownership and corporate governance and its impact on bank risk is long overdue to stimulate more research and policy formulation to help better improve the banking system in Ghana. Also, the research provides empirical findings to add to the database on bank risks in Ghana.

1.8 Outline of Chapters

The chapters are composed as follows: Chapter one comprises the introduction to the background of research, research problem, the research purpose, research objectives, the research questions, the scope of the research and the importance of the study. Chapter two reviews literature on income

diversification, ownership structures among other factors relevant to this research. Chapter three presents the methodology used for the research, which covers the model used and further explains the various factors used in this research and also the sources of data employed. Chapter four presents the results of analysis of the panel data of the Ghanaian banks, the summary statistics of variables used in the research and the regression results of the research. Finally, Chapter five draws conclusions from the findings of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents theoretical and empirical research on bank risk. It explores factors that determine the risk-taking behaviour of banks. It also investigates evidence of factors that led to the changing nature of bank income activity from the traditional to non-traditional sources around the globe. Diversification in the banking sector is further explored in this chapter by noting the various sources of a bank's diversified income earnings. The theory of information asymmetry which underpins risk taking in the banking industry is examined under this chapter. Also, with explanations from finance theory, it is well established that banks should be funded by both equity and deposits. The persistency of profits, agency theories and other theories are all further examined and explained in this chapter.

2.2 Ghanaian Banking Industry

In Ghana, the banking industry contributed 31% of GDP in 2007 and 31.8% to GDP in 2008, held over GHS 809 million in capital as of 2008 from a previous bank capital of 7% of GDP in 2007 (Bokpin, 2013), banks in Ghana play a vital role in Ghanaian economy. On the contrary, the first ever formal and official bank to be established in Ghana was set up by the Bank of England in 1953 which was subsequently separated into two: one that issued bank notes being The Bank of Ghana later to converted into a fully-fledged Central Bank; and the other into the modern day Ghana Commercial Bank, the largest commercial bank (Obuobi, Nketiah, Awuah, & Amadi, 2019). Upon gaining independence from the British, the new government foresaw the creation of more banks with the legislation of Banks incorporated between the periods 1957 to 1965 which saw the creation of several state-owned banks, the Agricultural Development Bank for the

development of Agricultural related businesses; the National Investment Bank for the promotion of investment activities; the Merchant Bank for merchant banking; and to encourage and promote domestic saving in the citizenry ,the Social Security Bank.

However, the socialist policies of Ghana in the early 1960s, coupled with political instability caused a serious economic crisis which continued until 1983. These included tight controls on exchange rates along with trade deficits (import/export issues). There was subsequently a change from economic socialism to a more market economy in the 1980s. The Ghanaian banking industry experienced some major reforms since its original inception for some decades through economic liberalisation after the shift. During those turbulent times, majority of the banks then were solely foreign owned, however, by 1975 foreign involvement were limited to of total 60% in equity by an indigenisation decree passed in law (Adjei & Chakravarty, 2012). Economic policy reforms further changed the financial sector in 1986 and since then the entry of privately-owned banks (both local and foreign) has increased steadily (Adjei & Chakravarty, 2012). Notable among these reforms was the Financial Sector Adjustment Programme (FINSAP) (Adjei & Chakravarty, 2012, Bokpin, 2013) which was implemented in three phases across time; FINSAP-1 between period 1988–1991; FINSAP-2 from the period 1992–1995; and FINSAP-3 which started in 1995. Also, several regulatory changes have been witnessed, such as the Universal Banking Licence, introduced in 2003. In 2004, Banking Act 2004 (Act 673) the replaced the banking Law 1989 (PNDCL225) whiles the Foreign Exchange Act 2006 (Act 723) and the Whistle Blowers Act 2006 (Act 720) were promulgated in 2006. Changes continued to occur and in 2007, The Credit Reporting Act of 2007 (Act 726), the Banking (Amendment) Act of 2007 (Act 738) were enacted. The year 2008 in Ghana also witnessed further reforms in the forms of the Borrowers and Lenders Act of 2008 (Act 773), the Non-Banking Financial Institutions Act of 2008 (Act 774), the Home

Mortgage Finance Act of 2008 (Act 770) and the Anti-Money Laundering Act of 2008 (Act 749) with the introduction of the directive for banks in Ghana to comply with the International Financial Reporting Standards (IFRS), (Bokpin, 2013).

All these reforms were carried out in an effort to strengthen the banks, both local and foreign owned, to make them more profitable. That notwithstanding, a number of banks in both the public and private sector, with some even foreign owned, have either been recapitalised or liquidated. Recently, the Ghanaian banking crisis, which begun in 2017 through to 2018 and still yet to be fully resolved, exposed how locally owned banks are more prone to distress than their foreign counterparts in the same Ghanaian banking industry.

2.3 Bank Risk

Banks by default are exposed to several risks such as credit risk, liquidity risk, operational risk, among others, from their daily operations. Risk can be expressed as the exposure an organisation face due to one or more characteristics factors, known or unknown. Several extant literatures on bank risk often studied variables such as credit risk, liquidity risk, income diversification, among others. However, a measure of risk believed to capture multiple risks is the capital adequacy ratio. This ratio captures credit risk, market risk and operational risk (Hassan et al., 2016). There are several studies on bank risk in the banking industry which are most often from developed economies (Stiroh, 2004; Lepetit et al., 2008; Huang & Ratnovski, 2011; Kohler, 2013; Abedifar, Molyneux & Tarazi, 2014; Khan, Scheule, & Wu, 2017; Dahir, Mahat, & Bin Ali, 2018). Though there are some few studies on bank risk in the developing economies such as African but not enough in Ghana to be specific (Adzobu et al., 2016; Aboagye & Ahenkora, 2017).

All these researches sought to analyse the relationships between bank ownership structure, corporate governance and bank regulations, such as capital adequacy, other bank level variables such as bank funding strategies, banking activities, as these factors are known to affect bank's risk-taking behaviour. Bank of Ghana (2018), noted among other things that high non-performing loans; shareholders, related and connected party transactions; poor credit risk and liquidity risk management controls; non-existent capital; weak corporate governance, led to the severe insolvency and liquidity distress faced by these banks that impaired their asset quality, consequently leading to a banking crisis. However, there is still more gaps in our knowledge and understanding of these factors especially in the African context. Simply because some of these variables are country specific which keeps changing with time, globalization and technological advances (Anginer, Demirguc-Kunt, & Zhu, 2014). Hence the need to further study new and old factors considering the time that has elapsed from most of these studies.

2.3.1 Credit Risk

This type of risk is explained as the possible exposure of losses from a credit customer not being able to honour their obligations or failure to perform those obligations partially or fully in the desirable period of time (Hassan et al., 2016). As a means of mitigating this risk, banks often keep an amount of credit risk weighted assets to stop and offset damages which may occur due to their potential exposure to credit risk (Witzany, 2017). Non-performing loans, changes in values of collateral can all account for credit risk and it is expected that banking activities can affect the credit risk though the lending channel of diversification on income generating activities which increases the likelihood of default by risky borrowers. Credit risk is known to significantly

negatively affect the performance of banks threatening their stability (Funso, Kolade, & Ojo, 2012;Terraza, 2015).

2.3.2 Liquidity Risk

Liquidity risk occurs when banks use short term debt to finance long term projects or assets (Terrezza, 2015) and also pursue services which generates less revenue. If banks are able to gain access to short term debt like interbank borrowing to continually roll over their short-term liability, they should be safe from liquidity risk (Bluhm, Georg, & Krahn, 2016). However, the risk of failure to settle debts before due date with new short-term debt is probable and some methods of mitigating such risk is the hedging against liquidity risk is by maintaining tradable assets and also be highly transparent with the public. Since being clear and open with information to the general public can influence shareholders and investors to further fund the bank should there arise the need for funds (Ratnovski, 2013). Liquidity risk adversely affect both on performance and on reputation (Gonzalez Sanchez, & Morales de Vega, 2018).

2.3.3 Market Risk

Market risk is the probability of loss banks are exposed due to their strength in competition of their market or their market portfolio on or their balance sheet due to changes in interest rate, exchange rates and security prices (Hassan et al., 2016). To control for market risk, banks keep an amount of market risk weighted assets to prevent damage should they be exposed to market risk (Chen, Chiu, Huang, & Tu, 2013; Mun, 2015).

2.3.4 Operational Risk

Operational risk is the possibility of losses mainly due to poor ,unsatisfactory or ineffective internal processes or strategies or workforce and systems or factors that are external to the bank such as legal risk (Hassan et al., 2016). Asanović (2018) provided evidence that banking system indicators (internal factors) significantly increased the probability of occurrence of systemic banking crisis compared with macroeconomic factors.

2.4 Ownership Structure

All over the world, the banking industry is composed of both foreign and local banks. Economic liberalisation in countries allows penetration of foreign banks and the emergence of new domestic institutions to compete with the existing financial institutions (Adjei & Chakravarty, 2012). The type of ownership of banks has been established in literature to have a significant impact on the risk and returns of banks. The entry of foreign banks into domestic market is believed to make the banking industry more efficiency, especially because foreign banks bring new expertise. foreign banks are able to provide more sophisticated services to customers because they have more experience several banking businesses such as trade finance and foreign exchange business (Xu,2011) and this creates a competitive threat to domestic banks (Bouzgarrou, et al. 2018) and forces them to innovate and provide equally better service and more or perish. Hence, domestic banks endeavour to undertake invest into improvement initiatives such as improving its technology and enforcing prudential practices, such as greater loan loss provision however, it takes some time for most of these local banks to effectively employ these new managerial and operational skills introduced by the new foreign entrants.

As argued by Chen et al. (2009), entry of foreign capital can increase the probability of contagion in any financial crisis since foreign investors repatriating funds to parent companies during the 2008 bank crises this led to a poor share price of those banks increasing risk to the financial systems. De Haas & Van Lelyveld (2014), also confirmed that in the 2008 global financial crisis, foreign subsidiaries quickly minimised their lending faster than their domestic counterpart banks, and they may have exposed domestic banks to more liquidity risk due to their interdependence. Again, extant literature suggests that financial integration and liberalization affords foreign banks unrestricted access to cheaper foreign sources of funding since they can issue bonds and stakes on the international markets, however, domestic local banks with difficulty in accessing cheaper funds will have to settle for costly local equity which increase their costs of operations and make them less profitable (Neaime, 2016).

Bokpin (2013) found that foreign banks are generally more profitable compared to domestic banks and benefit from better quality loans. In other words, they are more cost-effective than domestic banks, however, not necessarily more profitable. Lassoued, Sassi, Ben, & Attia (2016), also reported that state owned banks took more risks while foreign banks reduced risk-taking. Pennathur et al., (2012) opined that public sector banks earn significantly less fee-income compared to private domestic banks, with foreign banks earning higher fee income and that fee-based income significantly reduces risk, by increasing profitability.

These factors indicate that increase in the entry of foreign bank is generally causes an increase in the operational costs of domestic banks, however, there seems to lake a general agreement on the impact of entry of foreign bank on the operational profits and risk of domestic banks.

2.5 Dynamics in Banking Activities

The global financial crisis of 2007-08 revealed the danger of over-reliance of banks on incomes from their loan portfolios (Demirgüç-kunt & Huizinga, 2010). It has also led to an increase in the interest of studying and understanding the impact of banks' income activity on stability and profits. Some researchers suggest that banks enjoy stability and profitability due to non-traditional activities (Edirisuriya et al., 2015), other argue against that positive relationship (Li & Zhang, 2013). Extant research agrees that the changing structure of bank incomes is as a result of regulatory changes or deregulation (Lepetit et al., 2008; Calmes & Liu, 2009). Furthermore, several recent studies argue that the type of non-traditional activities specialization (Köhler, 2014; Lee et al., 2014; Köhler, 2015), bank size (Hidayat et al., 2012), bank ownership (Pennathur et al., 2012) had an effect on the relationship between non-traditional activities and bank risk and bank profits.

Banking activities (i.e. income generating activities or business) traditionally generate income and profit from the business of making loans to their customers though there exist other activities of generating income and profits which are usually non-traditional such as bancassurance, etc. Previous studies have often measured the diversification of banking activities by separating income earning assets into two broad types: lending versus non-lending activities (e.g., Laeven & Levine, 2007; Guerry & Wallmeier, 2017). For this research, focus is placed on the non-lending activities of bank diversification since the effects of lending activities have been well studied.

The US abolished the Glass-Steagall Act of 1933 which separated commercial banking from investment banking and adopted the Gramm-Leach-Bliley Act of 1999 which introduced a universal banking model in 2008 (Demirgüç-kunt & Huizinga, 2010). Similar regulatory changes

are seen in Germany (Kohler, 2013), Canada (Calmes & Liu, 2009), Europe and other countries around the globe (De Jonghe, 2008). In Ghana, the Universal Banking Licence which was introduced in 2003, allowed banks with at least a minimum GHC 70 billion (as at that time) in capital to operate any form of banking activity (Bokpin, 2013). It allowed banks to perform a range of financial services, including commercial banking, investment banking and bancassurance (Lepetit et al., 2008; Demirgüç-kunt & Huizinga, 2010). The universal banking methodology has been widely adopted and used around the globe today. This universal banking model has been argued to be a more desirable structure, since it is resilient to adverse shocks of the financial crisis (Demirgüç-kunt & Huizinga, 2010).

Some scholars argue that the changing structure of bank incomes is due to competition and that recent technological developments in the banking industry has spurred competition (Frame, & White, 2014; Bajada, & Trayler, 2015). According to these studies, technological development has enhanced the provision of different types of financial services; through information processing Banks acquire customer data by providing one financial service that may prove helpful in providing other financial services to those same clients.

Stiroh (2006), opines that non-interest income part of a bank's income structure is slowly emerging as an important part of their revenue base, and he argues that the shift to non-interest income sources provides an avenue for diversification and general stability of the banking industries. Mostak (2017), reported that the higher the share of non-interest income the higher profit earned and risk-adjusted profits especially if banks engage in more trading activities. Ashraf, Ramady & Albinali (2016) also agree that banks involved in significant fee-based activities are financially stable as compared to banks that preponderantly earn incomes from traditional intermediation

activities. But, Demirgüç-kunt and Huizinga (2010) found that, bank income generated from non-interest is very risky and reduces the overall bank performance. Also, Williams & Prather (2010), argue that fee-based income is riskier than margin income though it offers diversification benefits to bank shareholders.

2.6 Changing Trends in Bank Funding

Banks, just as any business, need funding for their operations. From finance theory and empirical literature, it is established that banks must be funded by both equity and debt in order that managers are careful in the quality of loans made (Demirguc-Kunt & Huizinga, 2010). A bank's debt or liability is a composition of depositors' funds and non-deposited funds i.e. subordinated debts, wholesale funding, securitisation etc. Banks are now increasingly using short-term wholesale funds to supplement traditional customer deposits for running their businesses (Huang & Ratnovski, 2011; Aboagye & Ahenkora, 2017).

The recent global financial crisis exposed the dangers of the overdependence of the financial sector of most developed and even some developing economies on wholesale funding. In the US, interbank money market rates in the US increase dramatically in August 2007, reflecting perceptions of increased counter-party rates, and inter-bank lending in the US and Europe came to a virtual halt by October 2008 (Demirguc-Kunt & Huizinga, 2010). In Ghana, over 87% of the banks' assets are structured by debts, of which short-term debts often constitutes more than three quarters of the capital of the banks (Amidu, 2007). Also Aboagye & Ahenkora (2017) found that Ghanaian data suggested an increasing dependence of banks on each other and that overnight

interbank transactions grew substantially in the market from USD 18.2 billion in 2010 to USD 61.2 billion in 2014.

The effects of different funding strategies on bank risk has been studied in extant literature though with contrasting views. Huang & Ratnovski (2011) in studying wholesale funding, provided evidence to show that, the challenge of relying on wholesale funding may cause banks to fail when wholesale financiers withdraw funding on the basis of bad signals of bank solvency. Also, Demircuc-Kunt & Huizinga (2010) opine that, banks that prominently attract non-deposit funding are very risky. But Damar, Meh, & Terajima, (2013) are of the view that wholesale funding allows utilizing valuable investment avenues away from the constrained local deposit supply and the power of wholesale financiers to instil discipline in the market should reduce bank risk.

Preliminary comparative trend analysis of available data on the Ghanaian banking industry indicates a significant difference in the means of the type of bank funding depending on the type of ownership of the bank.

2.7 Corporate Governance

Corporate governance is a composition of tools and measures employed by shareholders of firms or organisations to monitor and check how managing directors and Chief Executive Officers of firms control and manage firm activities and operations, so as to increase firm value. Good corporate governance practices have been observed empirically to greatly impact on a firm's performance. Corporate governance problems in Ghana are covered by the 1963 Company Code, Act 179, Securities Industry Law 1993, PNDCL 333 and the Ghana Stock Exchange Membership

and Listing Regulations. Though the banking sector has seen many reforms and laws to enhance better regulations and to improve better corporate governance of banks, these bank regulations are often limited or highlights nothing on other bank-level variables of corporate governance practices such as issues of board size, board independence and CEO duality.

The Banking Act 2004 (Act 673) allows certain provisions that result in problems such as transfer of stocks affecting substantial shareholdings, denial of the transfer of stocks, prohibition of the transfer of stocks and modifications in stocks, control interests, the prescribed sanction for non-compliance, removal of managers or staff, disclosure of conflict of interest, and Bank of Ghana's involvement in appointments. All these provisions essentially bordered on ownership and control of banks in Ghana (Bokpin, 2013).

Corporate governance is an essential means of ensuring accountability of the managers in a firm by reducing the Principal-Agency problem. However, this owner / manager agency issue (or disputes between stockholders and executives) can be mitigated if the interests of directors (items) are aligned with stockholders ' interests. One way that interests can be aligned is through insider (managerial) possession of the stocks of the company, that is, a manager who also doubles as a board member. Ownership structures may have a more powerful effect on banks' risk characteristics during periods of deregulation compared to regulatory periods.

2.8 Conceptual Framework

The conceptual framework tries to relate how various variables explained in this study affects the risk and stability of banks. The agency problem that arises from a conflict of interest between managers and shareholders argues that a managers' incentive to enhance their own private benefits (Bendickson, Muldoon, Liguori, & Davis,2016) will cause them to lead diversification activities which can expose the banks to risky activities. In a competitive market, banks widen their operations beyond traditional activities and increase their share of non-interest income to increase their profits but this also exposes them to some level of risk (Damankah, Anku-Tsede, & Amankwaa, 2014). As the macroeconomic factors such as GDP improves, the economic condition of a country improves, people have excess funds to save with banks increasing deposits of banks, pay up loans and also consume more capital by require more loans

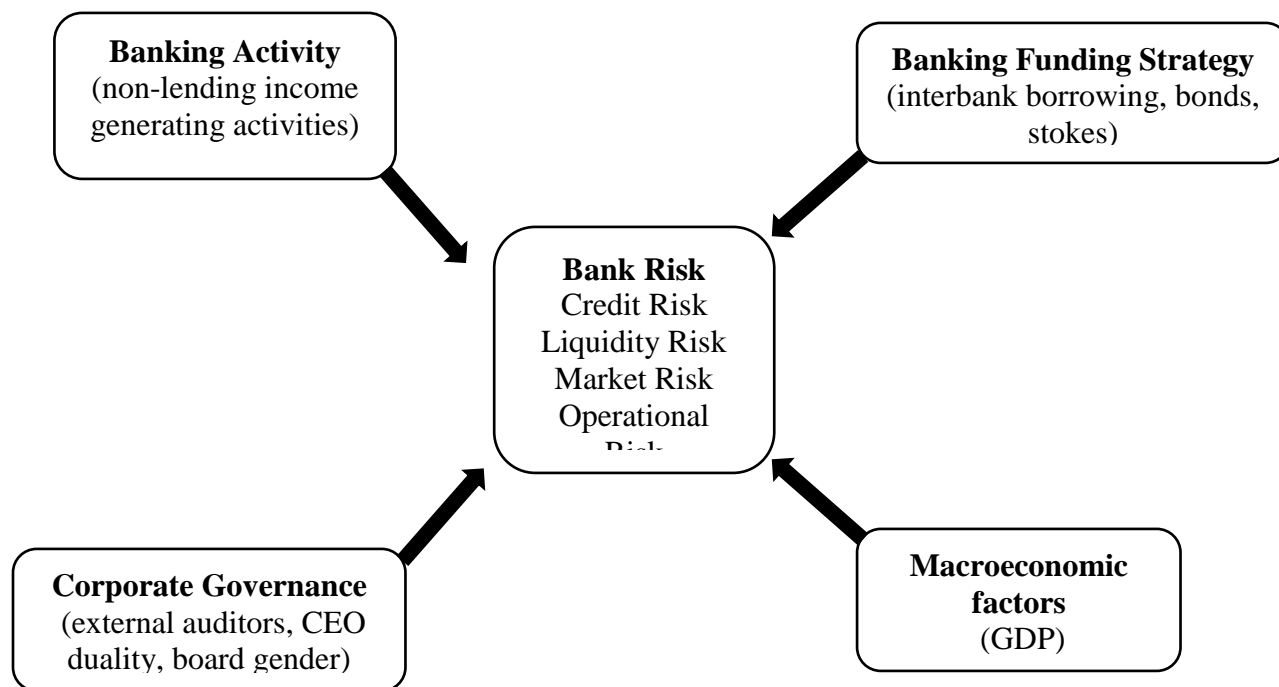


Figure 2.1 Conceptual framework of research

Source: Author 2019

2.9 Theoretical Framework

Several theories have been employed in the studying and explanation of the risk-taking behaviours of banks. In this research, the information asymmetry theory, the agency theory, the persistency of profit theory, are explained for understanding the risk-taking behaviours of banks.

2.9.1 Information Asymmetry Theory

The theory of information asymmetry is a commonly used theory in the business management field and international business (Cuypers, Ertug, & Hennart, 2015), and gives rise to adverse selection, a situation whereby only a party in any relationship has access to more information about the dealings or business than the other party. In general, most markets have asymmetric information instead of information efficiency. Several researchers have studied the relationship between market information asymmetry level, levels of firm assets, and performance (Fosu, 2013; Fosu, Danso, Ahmad & Coffie, 2016; Aye, Balcilar, Demirer, & Gupta, 2018). According to George (1970), the theory of information asymmetry is expressed as a market system where only the seller holds the best information on the quality of products than the buyers and this can cause an adverse selection of inferior products. In the banking industry, banks collect vital information about their customers and can benefit by proposing and selling products and service which may be of interest to the customer and of much profit generating to that banks and on the other hand customers of a bank who better know their credit default risk or financial position than the banks may borrow from the banks with less information about them.

From literature, adverse selection is the risk of exposure to losses as a result of asymmetry information between two transaction parties, however, moral hazard occurs after the agreement to

the transaction whereby one party has more information and knowledge exploits the other (George, 1970; Anginer, & Demircuc-Kunt, 2018). In banking the problem of adverse selection is identifying the best customer to lend money so as to reduce credit default. Less risky customers will prefer to pay lower rates than the average rate from banks while more riskier customer will opt for the average rate knowing their own financial strengths (George, 1970). On the other hand, moral hazard is the risk that risky borrowers with higher probability of credit default will abuse or ineffectively use borrowed funds through excessive risk-taking activities.

2.9.2 Theory of Persistency of Profits (POP)

Extant literature on the persistence of profits for banks explains the challenges of competitiveness in the banking market structure. It tries to explain bank profitability based on inherent variables of a bank such as its financial performance, liquidity, operations and risk and external variables of a bank the macroeconomic variables of the environment. The underlying principle of any market systems is that competition drive profits to zero on the long run with the price process improving social welfare by equalising the differential costs of all economic activity to its social benefits (Goddard et al., 2013; Amidu & Harvey, 2016). And that the entry of more new firms in and out of any industry is sufficiently enough to quickly get rid of any abnormal profit, with all profit rates converging towards the same levels for all firms in an industry in the long-run.

Also, Goddard et al. (2011), argued that for banks in developing countries, POP is weaker than those in more developed countries. Chronopoulos et al., (2015), further added that the persistence of profit theory offers a dynamic framework to study persistence of bank performance. There are basically two main underlying reasoning that competition drives profits to zero, first is the static view of competition with the second being the dynamic view. For the static view, existing market

competition among firms is able to achieve zero profit at same point in time between them and the dynamic view is that entry and exit of firms produce zero profit in the long run at different points in time. Sarpong-Kumankoma, Abor, Aboagye, & Amidu (2018), reported that higher levels of financial development leads to lower profit persistence in some African countries like Ghana and Kenya, however, does not matter in other countries like South Africa and Tanzania.

2.9.3 Agency Theory

Agency theory represents a fundamental theoretical frame for the study of the relationship between ownership and performance (Mohammed, & Muhammed, 2017). The Agency theory talks about the relationship between shareholders, as principals, and company executives. Agency theory attempts to explain the problems or issues associated with the challenges or misunderstanding that arise from this theory. Sometime, agents appointed by principals to act on their behalf have or exhibit dissimilar interest as those of the principals often time because they do not have skin in the game and take decisions in their own interest ignoring the greater interest of their principal. The agent is therefore a decision-maker who incurs little or no risk because any losses will be borne by the principal. Hence, Agency theory assumes that the interests of a principal and an agent are not always in alignment.

In the banking industry just like most business, the CEO or executives are the individuals given the mandate to run the day to day activities of the banks. These managers are so appointed due to the believe in their competences to deliver in their duties and roles as the head of their institutions. However, studies and reports have shown that, most managers or CEOs of banks more take decisions which are not in the greater interest of the shareholders of the bank. Managers sometimes make out loans to related parties who do not qualify for the loans just to personal gains and favours.

Whenever these individuals or entities are not able to repay these loans, they write them off as bad debts since it often does affect their contracted remuneration and work period. In an attempt to resolving the principal agent problem, it is proposed. compensation of managers of CEOs are based on Performance. Because financial compensations are tied to the financial performance of the banks. The CEOs are often enticed to employ managerial strategies and policies which are often high yielding in terms of profits yet equally high risk.

2.10 Contribution to Literature

This present research will contribute to the bank risk-taking literature by filling two principal gaps. The research contributes to gaps such as method and time which arise following the context gap by consider more recent time complete data collected after the global financial crisis. To also provides supplementary literature to the few extant literature relation to bank income diversification in Ghana. As it is imperative to build a repository of knowledge about bank risk that can lead to financial crisis as have been observed in America Europe, Asia and North America in the last two decades and even in recent times in Ghana.

2.11 Chapter Summary

In this chapter is a comprehensive review of some related previous works on bank diversification of income, bank funding strategy and ownership of banks. It also reviewed additional variables which are often believed to impact bank risk-taking behaviours in existing literature such as performance, size, capital. Discussion on some relevant theories such as the persistence of profit, information asymmetry and agency theory were also done. These discussions helped in the

formulation of a conceptual framework that guided the research. The contributions of this research are stated in the latter part of the chapter classified.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology employed in the analysis of the stated objectives of the study. It begins with the research design, the type of data used and where it was sourced from. Specified empirical models and estimations of the variables used in the models are also presented in this chapter. Finally, this chapter describes how the results of the analysis are presented.

3.2 Research Design

This research employed the panel regression model analysis. The panel regression model approach was used because it was effective at establishing the significance of relationships and examining the impacts of Non-Interest Income variables, Non-deposit Funding variable and Corporate Governance variables on the bank risk.

Panel regression helps to study the effect of variation within each bank over time, across the different banks and also the general trend or changes in the sector over the period of interest and can provide more robust results. Panel model analysis is able to produce more accurate inference of model parameters, helps in the constructing and testing of more complex behavioural hypotheses while also being able to control the impact of omitted variables (Hsiao et al., 2006 et.). To fully benefit from the depth of this dataset, the study will select based on the results of the Hausman test, one of the three panel data estimation techniques to use Pooled Regression Model, Random effects and Fixed effects.

3.3 Data Issues

The research used accounting data from the published financial statements of banks in Ghana. The financial data of the Ghanaian banks were used to construct a panel data of 30 banks spanning from 2006 to 2015 and excluded banks incorporated after 2015. The data period is chosen because it provided more than half a decade's data after the global financial crisis (2008-2015) enough to generate some sufficient estimates of population parameters.

Also, some banks were previously registered with a different name and were acquired by a new entrant into the banking sector and operated with a new name. For such banks, previous year banking data from the old banks within the period of study were compiled together with subsequent banking data of the new entrant also within the period of study.

3.4 Sources of Data

An unbalanced panel dataset of 30 banks, with yearly observations was created from available individual annual bank reports and financial statements published of Ghanaian banks spanning 10 years - from 2006 to 2015.

Table 3.1 Data Sources

VARIABLE	MEANING	SOURCE
GDP	Gross domestic products	World development indicators
FINC	Fee and commission income	Authors computation
NDEPF	Non-deposit funding	Authors computation
CAR	Capital asset ratio	Authors computation
ROA	Return on asset	Authors computation
SIZE	Size of bank	Authors computation
BODSIZE	Size of board	Bankscope database
BODGEN	Ratio of female board members	Bankscope database
AUDITOR	External auditors	Bankscope database
CEODUA	CEO duality	Bankscope database
NONEXEC	Ration of non-executive members	Bankscope database

3.5 Model Specification

The objective of the research is to empirically analyse the impact of banking activity on bank risk of both local and foreign banks in Ghana, and also examine how bank funding strategies affect the bank risk of both local and foreign owned banks.

The first model measured the impact of variables of banking activities on bank risk of banks in Ghana comparing their type of ownership. The second model measured the effects of corporate governance on bank risk in Ghana comparing the type of ownership. The third model measured the effect of interaction of banking activity and funding strategy on bank risk of banks in Ghana. Because bank risk can be influenced by both time and firm specific effect, this study employs panel data analysis methods to accomplish the set of stated objectives of the research.

3.5.1 Model 1

$$Zscore_{it} = \beta_0 + \beta_1 FINC_{it} + \beta_2 NDEPF_{it} + \beta_3 Own_{it} + \beta_4 \begin{cases} 1 \\ 0 \end{cases} Own_{it} + \beta_4 Clrt_{it} + \varepsilon_{it} \dots (1)$$

3.5.2 Model 2

$$Zscore_{it} = \beta_0 + \beta_1 FINC_{it} + \beta_2 NDEPF_{it} + \beta_3 XCorp_{it} + \beta_4 Own_{it} \begin{cases} 1 \\ 0 \end{cases} Own_{it} + \beta_5 Clrt_{it} + \varepsilon_{it} \dots (2)$$

3.5.3 Model 3

$$Zscore_{it} = \beta_0 + \beta_1 Finc_{it} + \beta_2 NDepf_{it} + \beta_3 Finc_{it} \times NDepf_{it} + \beta_4 Clrt_{it} + \varepsilon_{it} \dots (3)$$

3.6 Description of Variables

The variables of this research have been decomposed into three main classifications: dependent variables, independent variables and control variables. The dependent variable is the bank risk variable while the independent variables capture firm specific variables which are of keen interest to this research. Finally, control variables are the other independent variables of less interest to the research which can also affect bank risk and so included in the specified model to separate their effects from those of the explanatory variable of interest.

3.6.1 Dependent Variables (Z-SCORE)

$Zscore_{it}$ is a bank risk variable for Ghanaian bank (i) in time (t).

This adopted the measurement of bank risk following Demirguc-Kunt & Huizinga (2010), Hidayat et al. (2012) and Kohler (2013), who considered the Z-score, standard deviation of return on assets (SDROA) but ignored average ratio of loan loss provisions to net loans (LLP) used by Lepetit et al. (2008) because it is traditionally backward looking and highly procyclical (Kohler, 2013). For the purpose of this research, the Z-score was used as the risk variable because the Z-score is a general measure of bank risk and capture credit, liquidity and market risk which fundamentally arises from non-lending activities. The Z-score is a risk variable which inversely indicates the probability of bank failure (Hidayat et al., 2012). Hence, lower values of this measure indicate a higher probability of default, in other words a bank with a higher insolvency risk. That is, a higher Z-Score indicates that the bank incurs less risks and is more stable, and vice versa. This measure of bank risk is extensively used in extant literature on bank risk-taking (see for example, Laeven & Levine, 2009; Gropp, Hakenes, & Schnabel, 2010; Delis & Kouretas, 2011; Amidu, 2013).

The Zscore measure distinctively indicates the lowest number of standard deviations of an expected value of a bank's return on assets at which point the equity is depleted making the bank insolvent (Kohler, 2013).

The $Zscore_{it}$ variable is defined as the ratio of the **Return on Assets + Capital Asset Ratio** to the **Standard Deviation of ROA** of Ghanaian bank (i) in time (t). The standard deviation of ROA was calculated with a rolling 3-year window.

$$Zscore_{it} = \frac{CAR_{it} + ROA_{it}}{StdROA_{it}}$$

3.6.2 Independent Variables

For this research, a number of independent variables were used. We focused on Fee and Commission Income (FINC), a decomposition on bank income diversification, Non-Deposit funding (NDEPF) and Corporate governance variables (Corp).

3.6.2.1 Bank Activity, Fee and Commission Income (FINC)

$FINC_{it}$ represents the variable the non-interest income generation activity.

Fees and Commission income (FINC) is measured in the model as the ratio of net fees and commissions income divided by the total operations income for a bank (i) in the year (t). The non-interest income activities measure of the levels of income diversification in non-traditional banking activities (Stiroh, 2004 Altunbas et al., 2011; Demirgüç-kunt & Huizinga, 2010; Kohler, 2012; Hidayat et al., 2012). Meslier et al. (2014) defined non-interest income as the ratio of non-interest

income to operating income and provides evidence showing that banks that heavily attract fees and commission income are very risky.

This variable is expected to have a positive relationship with bank risk.

$$FINC_{it} = \frac{\text{fee income}_{it} + \text{commission income}_{it}}{\text{total operational income}_{it}}$$

3.6.2.2 Bank Funding strategy; Non-Deposit Funding (NDEPF)

$NDEPF_{it}$ is the non-deposit funding variable for Ghanaian banks (i) at time (t) which represents the funding strategies of the bank. It is the ratio of the share of Non-deposit/Short-term funding in total deposits and short-term funding:

$$NDEPF_{it} = \frac{(\text{interbank borrowing} + \text{subordinate debts})_{it}}{\text{Total Liability}_{it}}$$

This variable is expected to have a positive effect on bank risk.

3.6.2.3 Ownership

The ownership is proxied by a dummy variable and takes on the value of one (1) if the bank is a local bank and takes on the value of zero (0) if the bank is foreign bank. For this research, a bank is considered a local bank if 51 per cent or more of its incorporated shares of the bank is owned by Ghanaian individuals or firms. A foreign bank has 51 per cent or more of its incorporated shares

owned by non-Ghanaian individuals or firms. This is expected to have either a negative impact on bank risk for a local bank and a positive impact on bank risk for foreign bank (Bokpin, 2013). According to Wu, Chen, Jeon, & Wang, (2017), the risk of domestic banks increases with the entry of foreign banks in host countries.

3.6.3 Corporate Governance

$XCorp_{it}$ is a vector of Corporate Governance variables: **CEODUA**, **BODSIZE**, **BODSIZESQD**, **BODGEN**, **NONEXEC**, **AUDITOR**.

3.6.3.1 Board Size (BODSIZE)

BODSIZE is a proxy for board size, and measures the number of members on the firm's board of directors. It is measured as the number of board members for the firm i at time t (Abor, 2007). Extant literature shows that the size of a board, as a corporate governance variable, can have either a positive or negative influence on the performance of a firm (Kyereboah-Coleman, 2007; Adam & Mehran, 2010). This research used both the number of board members and its square to study how expanding the size of the board affects bank risk. A larger board size have many board of directors who can influence the decision on the quality of loan making (Akbar, Kharabsheh, Poletti-Hughes, & Shah, 2017).

3.6.3.2 CEO Duality (CEODUA)

CEODUA is a proxy for CEO duality. It is a dummy variable which takes the value of one when the Chief Executive Officer also doubles as board chairman, and zero if otherwise. The Securities

and Exchange Commission (SEC) recommends that the position of CEO and the board chair should not be vested in the same person so as to increase accountability and enhance the independency of the board, but the stewardship theory argues the two positions should be vested in the same person, since it enhances swift decisions making. However, most researchers have often found mixed evidence for the impact of CEO duality. For other researchers, companies with CEO duality reported stronger financial performance relative to other companies (Kyereboah-Coleman, & Biekpe, 2006; Yasser, & Al Mamun, 2015).

It is therefore expected to have either negative or positive relationship with bank risk.

3.6.3.3 Non-Executive Directors (NONEXEC)

Non-Executive Directors is a proxy variable for the independent of a board and is measured as a ratio of independent non-executive directors by the total number of the board of directors (Akbar et al., 2017). Extant literature provides evidence to show that board independence can have a negative impact on corporate risk taking and that agency conflicts can be controlled and minimised by increasing the number of non-executive directors. The presence of non-executive directors is expected to be effective in monitoring the managers and in protecting their own reputation in the labour market (Battaglia, & Gallo, 2017). Wang, & Hsu, (2013). reported a negative relationship between the independence of a board and bank risk, arguing that boards which exhibited high quality governance can lead to lower risk-taking behaviours of a company.

Therefore, this variable is expected to have a negative effect on bank risk.

3.6.3.4 Board Gender (BODGEN)

Board gender (BODGEN) is a number of female members of board of directors of the bank. From theory, when there are women appointed as board members of a company, that company is expected to perform better (Abobakr, & Elgiziry, 2017; Adeabah, Gyeke-Dako, & Andoh, 2019). The presence of women directors should bring on board different attitudes towards risk, and since women are often found to be more risk-averse than men, this can reduce the bank's risk-taking behaviour (Palvia, Vähämaa, & Vähämaa, 2015).

It is therefore expected to have a negative relationship with banks risk.

3.6.3.5 Auditors (AUDITOR)

Auditor (AUDITOR) is a dummy variable and takes the value of one if the financial statement of the bank is externally audited by one of the top four accounting firms in the country (KPMG, PWC, Ernst & Young and Delotte & Touche) and zero if otherwise. Larger accounting and auditing firms provides better more accurate and reliable audit based of opinion (Yeung & Lento, 2018). External auditors enhance public trust in financial institutions and as such helps in financial stability and market confidence, by appending its signature to accounting information prepared by the management of the bank and signalling the reliability of financial statement information. Therefore external audits are a control mechanism for protecting shareholders and investors from agency risk (Quick & Schmidt, 2018).

External auditor is therefore expected to have negative impact on bank risk for banks with external auditors.

3.7 Control Variables

$Clrt_{it}$ is a vector of variables used to control bank risk for the study; **SIZE**, Capital Asset Ratio **CAR**, Return on Assets **ROA**, Gross Domestic Products **GDP**.

3.7.1 Size

Size represents the total financial magnitude of a bank. Size is measured as the natural logarithm of total assets of the bank (i) at a time (t). The asset size of banks is an important factor in determining risk taking behaviour of banks. The phenomenon of “too big to fail” usually associated with large banks ensures that governments do everything in their power to keep large banks in business (Alhassan, & Tetteh, 2017). This phenomenon of “too big to fail” is seen to induce the risk appetite of banks and cause them to excessively diversify bank earnings (Hidayat et al., 2012; Kohler, 2014).

A positive relationship is therefore expected between bank risk and size of a bank.

3.7.2 Capital Asset Ratio (CAR)

CAR is the Capital Asset Ratio and is the ratio of equity of the bank (i) at time (t) to total assets of the bank (i) at a time (t). Vo, (2018), reported that banks with lower capital asset ratio (CAR ratio) are riskier and often associated with higher rates of lending. Firms with higher leverage are exposed to higher risk. Ofoeda, Gariba, & Amoah, (2016), provided banks that maintained a minimum capital adequacy requirement of 10 % were profitable hence, higher CAR exhibits a positive relationship with profitability and a indicates a negative relationship with bank risk.

Therefore, it is expected that higher capital asset ratio should make a bank more stable, indicating a negative relationship with bank risk.

$$CAR_{it} = \frac{Equity_{it}}{TotalAssets_{it}}$$

3.7.3 Return on Asset

ROA is the Return on Asset and is measured as the ratio of profit before tax to total assets of a bank (i) at a time (t) as employed by Demirguc-Kunt & Huizinga (2010) who provides evidence that increasing returns on assets increases stability of banks. ROA is expected to have a negative impact on bank risk.

$$ROA_{it} = \frac{pretax\ profit_{it}}{total\ asset_{it}}$$

3.7.4 Gross Domestic Product

GDP is the natural logarithm of the GDP of Ghana at time (t). GDP is expected to have a negative impact on bank risk. The general economic conditions of a country have significant impact for bank risk. As the economic condition of a country improves, people have excess funds to save with banks increasing deposits of banks, pay up loans and also consume more capital by require more loans. Extant literature has shown that GDP and GDP growth are important determinants of non-performing loans and the overall loan demand in the economy (Ayuso et al., 2004).

The higher the incomes of the citizenry, the higher the levels of savings which consequently increase domestic saving in financial accounts (Adusei, 2015).

Therefore, this variable is expected to have a negative effect on bank risk.

3.8 Conclusion

The research methodology is presented above relating to the method and design that will be applied in achieving the research objective. The population, data collection, analysis and presentation have been well elaborated to aid achieve results. Consequently, the findings obtained from application of the above chapter on the research is presented, analysed and discussed in the subsequent section.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The chapter presents the analysis of the panel data for the Ghanaian banks. First, the summary statistics of all the variables used in the research are presented. The descriptive statistics examine the main characteristics of each variable by examining the average results of the variables and the standard deviation of the variable across the sample period. Secondly, the research examines the impact of non-interest income variables and funding strategy variables on bank risk for Ghanaian banks. The results provide an understanding of how non-interest income variables and funding strategy variables impact bank risk of Ghanaian banks.

The research presents and discusses results for the effects of corporate governance variables on bank risk for both local and foreign banks in Ghana. Also, results for the effect interaction of banking activity and funding strategy on bank risk of banks in Ghana are presented and discussed in this chapter. Finally, the results presented in this chapter are discussed with literature in order to examine findings that are consistent or inconsistent with empirical results in other contexts.

4.1 Descriptive of Summary Statistics

This section presents concisely the statistical features of the variables used in the econometric model for all three stated models. Statistical characteristics such as the mean, standard deviation, minimum and maximum values are shown for each variable from the period 2006 to 2015.

Table 4. 1 Summary Statistics of Ghanaian Banks

VARIABLE	OBS	MEAN	STD. DEV.	MIN	MAX
BKCD	300			1	30
ZSCORE	239	5.28467	4.92578	-0.9001	31.3845
FINC	239	0.20333	0.08782	0	0.52605
NDEPF	239	0.14778	0.14074	0	1.19109
SIZE	239	13.2244	1.44442	5.35659	15.8645
CAR	239	0.15934	0.11417	0.00892	0.89608
ROA	239	0.04441	0.23533	-0.2091	3.62426
GDP	300	24.2622	0.21919	23.941	24.5628
BODSIZE	237	8.39662	2.11403	4	12
BODSIZESQD	237	74.9536	35.5266	16	144
NONEXEC	237	0.43209	0.24967	0	0.85714
BODGEN	237	0.1402	0.10733	0	0.375
CEODUA	237	0.18987	0.39303	0	1
AUDITOR	245	0.62449	0.48525	0	1
OWNERSHIP	300	0.5	0.50084	0	1

BKCD = bank code, ZSCORE= bank risk proxy, $(CAR + ROA)/stdROA$, FINC = ratio of fees and commission income to total operational income, NDEPF= ratio of(interbank borrowing + subordinate debts) to total liability, SIZE = natural log of total assets, CAR= ratio of equity to total assets, ROA= ratio of pretax profit to total assets, GDP = natural log of gross domestic product, BODSIZE= number of board members, NONEXEC= ratio of non-executive to total board members, BODSIZESQD= squared of BODSIZE, BODGEN= ratio of female board members to total board members, CEODUA= proxy for CEO who double as board members, AUDITOR = proxy for banks with external auditors among top 4 audit firms.

Source: Author's Analysis 2019, Bankscope Data

From the above summary statistics, 30 banks in Ghana were considered in the research. Results for the variables of interest in the research are as follows:

Bank risks, Z-score (ZSCORE), reported an average of 5.28 for banks in Ghana, with an interval range of -0.90 and 31.38 (see Table 4.1). The mean result indicates that Ghanaian banks, on average, have a bank risk with a Z-score of 5.28, though some of the Ghanaian banks showed a marginal lower Z-Score of negative, indicating that some of them are risky.

Fees and Commissions' income (**FINC**) for Ghanaian banks reported an average result of 0.20, with a maximum bound of 0.53 is reported (see Table 4.1). The results show that on the average **FINC** accounts for about 20 per cent of total operating income for local banks. Non-Deposit Funding (**NDEPF**) for Ghanaian banks showed a mean of 0.15 with a the highest bound of 1.19. The results indicate that, while Ghanaian banks on the average fund their operations by about 15 per cent of funds other than customer deposits, some banks fund their activities by over 119 per cent of other forms of liability other than customer deposits.

Capital Asset Ratio (**CAR**) recorded a mean of 0.16 with a higher bound of 0.90 for Ghanaian banks. The results indicate that on average, the equity of Ghanaian banks amounts to only 12 percent of their total Assets volume with the highest ratio of about 90 percent by some Ghanaian banks. Return on Asset (**ROA**) reports an average of 0.04 for Ghanaian banks with lowest bound of -0.21 and higher bound of 3.62. The results indicate that on average, most Ghanaian banks make a Pre-tax profit of about 4 per cent of their total assets, with some banks reporting loses and others very high Pre-tax profits.

Board Size (**BODSIZE**) for Ghanaian banks reported an average of about 8 members of a board with a minimum of 4 and a maximum of 12. Non-Executive Directors (**NONEXEC**) for Ghanaian banks reported an average of about 43 per cent of board members to be non-executive with some local banks having no non-executive board members and some with as high as 86 per cent being non-executive board members. Female members of the board (**BODGEN**) for Ghanaian banks reported an average of about 14 per cent. While some boards of banks had no female members at all; others had as high as about 38 per cent being females (see table 4.1).

4.2 Diagnostic Test

This section deals with important pre- estimation tests which arise in panel data analysis. The prevalent ones are considered in our analysis, thus, Breusch-Pagan Test, serial correlation and heteroscedasticity, normality test, and correlation matrix.

4.3.1 Testing for Multicollinearity of Explanatory Variables

The correlational matrix is used to identify strong correlation between the explanatory variables. The table 4.2 presented below is the correlation matrix between the explanatory variables in this research. Multicollinearity is identified by observing strong correlation of a correlation coefficient of 80 per cent and above, between the explanatory variables. There exists no significant correlation between all the other explanatory variables, and so there is no multicollinearity among the variable

Table 4.2. Correlational Matrix of Explanatory Variables

	ZSCORE	FINC	NDEPF	BODSIZE	BODSIZE ²	NONEXEC	BODGEN	CEODUA	AUDITOR	OWNER
ZSCORE	1									
FINC	-0.3882 (0.7291)	1								
NDEPF	0.1317 (0.7891)	-0.1662 (0.8562)	1							
BODSIZE	-0.2079 (0.7422)	0.1970 (0.7364)	-0.1963 (0.6589)	1						
BODSIZE ²	-0.1904 (0.8112)	0.1665 (0.7921)	-0.177 (0.7804)	0.9877 (0.8954)	1					
NONEXEC	0.0540 (0.7002)	-0.0302 (0.9631)	-0.0257 (0.8861)	-0.0607 (0.6891)	-0.1229 (0.8871)	1				
BODGEN	-0.0695 (0.8641)	-0.0692 (0.9432)	-0.0763 (0.6989)	0.1959 (0.8711)	0.1806 (0.6891)	0.1713 (0.8790)	1			
CEODUA	-0.0656 (0.8891)	0.0299 (0.7891)	0.2806 (0.8601)	-0.2477 (0.8822)	-0.2382 (0.9912)	0.0747 (0.7135)	-0.2337 (0.7091)	1		
AUDITOR	0.0378 (0.8097)	0.0642 (0.6890)	0.0167 (0.7881)	-0.2374 (0.9833)	-0.2092 (0.7891)	-0.069 (0.7891)	-0.1174 (0.7891)	0.0509 (0.7891)	1	
OWNER	-0.261 (0.9567)	-0.0221 (0.8334)	0.1632 (0.7841)	-0.0589 (0.7391)	-0.0659 (0.7290)	-0.0066 (0.8827)	0.0605 (0.7993)	0.3023 (0.8721)	-0.461 (0.7810)	1

Source: Author's Analysis 2019, Bankscope Data, WDI

4.3.2 Serial Correlation and Heteroskedasticity

4.3.2.1 Heteroscedasticity

A test of heteroscedasticity using the Breusch- Pagan test was conducted. The test was conducted under the null hypothesis of “homoscedasticity”, using the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity. The tables below present the estimates of the test of homoscedasticity for the three multiple linear regression models.

Table 4.3 Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Models	Chi2- statistic	Prob > chi2
Model 1	86.79	0.0000
Model 2	97.08	0.0000
Model 3	67.60	0.0000

Source: Author’s computation using STATA

There is the presence of heteroscedasticity, judging from the respective Prob > chi2 values of all the models among the Local Banks and Foreign Banks. In order to address this issue of non-constant variance, the robust option is issued to obtain heteroscedastic- robust standard errors (also known as the Huber/ white or sandwich estimators).

4.3.2.2 Serial Correlation

A test of assumption of no autocorrelation in the error term using the Wooldridge test for autocorrelation was conducted. The assumption was tested under the null hypothesis of “no first order autocorrelation”. The result of the Wooldridge test for autocorrelation is presented below.

H_0 : no first order autocorrelation

Table 4.4 Wooldridge test for autocorrelation

Models	d.f	F- statistic	Prob > F
Model 1	F (1, 26)	51.775	0.0000
Model 2	F (1, 26)	47.354	0.0000
Model 3	F (1, 12)	50.353	0.0000

Source: Author's computation using STATA

The result of the Wooldridge test indicates that the null hypothesis of no autocorrelation was rejected, and the alternate hypothesis of autocorrelation was retained by the study (see Table 4.4).

The results show the presence of autocorrelation in the regression model.

The presence of serial correlation is justified as the respective Prob> F values for all the models.

Thus, the null hypothesis of no autocorrelation is rejected for all models. Again, resolving the issue of serial correlation is to apply the robust command in running the pooled regression model.

4.3.2.3 Hausman Test for Random Effect versus Fixed Effects

As indicated earlier, the right panel estimation technique is needed to analyse the data. Therefore, the Hausman test for random effects estimation against the Fixed effects estimation was carried out. Results from **table 4.5** below imply that, for Model 1, we reject the null hypothesis in favour of using the fixed effect estimation. But for the Model 2 and Model 3, we accept the null hypothesis in favour of using the random effect estimation

Table 4.5 Hausman Test results

Models	Chi2- statistic	Prob > chi2
Model 1	16.84	0.0099
Model 2	15.58	0.1575
Model 3	19.50	0.0771

Source: Author’s Analysis 2019, Bankscope Data

4.3.2.4 Breusch-Pagan LN Test for Random Effect versus OLS

Also, the Breusch-Pagan tests are carried out to choose between the random effect estimation and OLS estimation, for the most efficient and consistent estimator. This test is conducted for each of the two Models 1 and 2 specified for Ghanaian banks. The tables below present the summary of the Breusch-Pagan test.

Table 4.6 Breusch-Pagan Test results

Models	Chi2- statistic	Prob > chi2
Model 1	0.34	0.2798
Model 2	2.17	0.0702
Model 3	2.27	0.0658

Source: Author’s Analysis 2019, Bankscope Data

Where δ_i = individual heterogeneity (firm-specific effect) ϵ_{it} = overall model’s error term

Based on the Prob>chibar2 values for each of the models from the tables above, we accept the alternate hypothesis of pooled OLS regression for all the Models 1,2, and 3 and we reject the null hypothesis of random effects as the appropriate model for the Models because the p-value for all three models were insignificant. Thus, the test suggests that, the pooled OLS regression model as

the appropriate estimation technique for studying bank risk for Ghanaian banks. Therefore, Pooled Ordinary Least Squares Regression was used for the analysis of this study for all the models

4.4 Regression Results and Discussion

This section presents the analysis and discussion of regression results for banks in Ghana.

4.4.1 Comparative Regression Analysis for Both Local and Foreign Banks

Three regression models were employed in the analysis for Ghanaian Banks using the Ownership dummy variable to help compare for both local and foreign banks.

Model 1 used ZSCORE as the dependent variable of the regression model, FINC and NDEPF as the independent while SIZE, CAR, ROA, GDP were considered as the control variables.

Model 2 also employed ZSCORE as the dependent variable but considered BODSIZE, NONEXEC, BODGEN, CEODUA, and AUDITOR as the independent variable and again SIZE, CAR, ROA, GDP were considered as the control variables.

The Model 3 also employed ZSCORE as its dependent variable but FINC, NDEPF, INTER, the interaction variable of (FINC x NDEPF), were considered as the independent variables and again SIZE, CAR, ROA, GDP were considered as the control variables in the research.

4.4.2 Fee and commission Income, Non-Deposit Funding and Bank Risk

This sub-section presents results for the impact of Fee and Commission income (FINC) and Non-Deposit Funding (NDEPF) on Bank risk (ZSCORE) for banks in Ghana. The results have been presented below (see Table 4.7).

Table 4.7 Tab Regression Results of Impact of FINC, NDEPF on Bank risk

Variables	Model 1 ZSCORE
FINC	-.361 (1.75)
NDEPF	1.970 (0.98)**
SIZE	0.157 (0.12)
CAR	32.114 (1.41) ***
ROA	1.865 (0.59) ***
GDP	7.940 (0.82)***
OWNERSHIP	-0.543 (0.29)*
Cons.	-194.793 (18.91)***
R ²	0.83
N	239

Coefficients & Standard Errors (in parenthesis) Significant levels at 10%, 5%** & 1%****

ZSCORE= ratio of return on asset and capital ratio to standard deviation of return on assets FCI= ratio of fees and commissions' income to total operating income NDEPF= ratio of ratio of (interbank borrowing + subordinate debts) to total liability, SIZE = natural log of total assets CAR= ratio of equity to total assets ROA= return on assets GDP = natural log of gross domestic product **Source: Author's Analysis 2018, Bankscope Data**

Non-Deposit Funding (**NDEPF**), from the results presented in table 4.7, reported a positive significant relationship with **ZScore** for Ghanaian banks. The results indicate that, as the shares of NDEPF increases for banks in Ghana, this will lead to a unit increase in the bank **ZScore** variable. As the **ZScore** increase it makes banks more stable hence, less risky. This result is quite similar to results found by Damar, Meh, & Terajima, (2013), who is of the view that wholesale funding allows exploiting valuable investment opportunities without being constrained by the local deposit supply and the ability of wholesale financiers to provide market discipline should reduce bank risk. Wholesale funding affords banks to refinance unexpected retail withdrawals.

Return on Assets (**ROA**) also recorded a highly positive significant relationship with **ZSCORE** for banks in Ghana. The results indicate that when **ROA** increases for Ghanaian banks, they become more stable. This result is supported by Demirguc-Kunt & Huizinga (2010), who provides evidence that increasing returns on assets increases stability of banks

Gross domestic products (**GDP**) showed a significant positive relationship with **ZSCORE** for Ghanaian banks (see Table 4.4.1). The result indicates that, an increase in the GDP of Ghana will increase the stability of bank, how Gross domestic products (**GDP**), a macroeconomic factor, affects bank risk in the Ghanaian banking sector. This result is supported with evidence from Adusei, (2015) who agree that GDP growth is an important determinant of non-performing loans. So, increasing GDP reduces non-performing loans, making banks more stable.

Ownership type of Ghanaian banks reported a significant negative relationship with bank risk for Ghanaian banks. This result indicates that local banks are riskier and less stable than foreign banks. This result is in line with the argument by Bokpin (2013) who found that, foreign banks are more

profitable than domestic banks. Ghanaian banks on the average, holding all other variables constant are risky.

4.4.3 Corporate Governance and Bank Risk

This sub-section presents results for the impact corporate governance on Bank risk (ZSCORE) for Ghanaian banks. The corporate governance variables employed in the regression analysis are BODSIZE, BODSIZESQD, BODGEN, NONEXEC, CEODUA, AUDITOR. The results have been presented in the paragraphs below (see Table 4.8).

The results from Table 4.8 below show that the presence of female board members (**BODGEN**) reported a significant positive relationship with bank risk for Ghanaian Banks. This result relates to arguments that when there are women appointed as board members of a company, that company should perform better (Adam and Ferreira, 2009; Abobakr, & Elgiziry, 2017; Adeabah, Gyeke-Dako, & Andoh, 2019). The ratio of Non-Executive board members (**NONEXEC**) reported a significant negative relationship with bank risk for Ghanaian banks. As the ratio of non-executive directors improve, banks become more risk averse and take less risk which can reduce their income. This result agrees with argument by Palvia, Vähämaa, & Vähämaa, (2015). Also, while numerical strength of the board is significant in improving profitability, it may lead to cost inefficiency as found in Ghana by Bokpin (2013).

Chief executive officers who double as board members (**CEODUA**) reported a significant positive relationship with ZSCORE for Ghanaian banks, and it is in line with arguments of stewardship theory and evidence provided by Yasser, & Al Mamun, (2015).

Table 4.8 Regression Results of Impact of Corporate Governance on Bank Risk

Variables	Model 2
	ZSCORE
FINC	0.183 (1.86)
NDEPF	1.550 (1.03)
BODGEN	3.339 (1.40) **
NONEXEC	-1.091 (0.63) *
CEODUA	0.717 (0.40) *
AUDITOR	-.265 (0.36)
BODSIZE	0.219 (.49)
BODSIZESQD	-.018 (0.03)
SIZE	0.094 (0.13)
CAR	32.330 (1.50) ***
ROA	1.880 (0.59) **
GDP	8.412 (0.86) ***
OWNERSHIP	-0.85 (0.36) *
CONS.	-208.778 (19.79) ***
R ²	0.84
N	232

Coefficients & Standard Errors (in parenthesis) Significant levels at 10%, 5%** & 1%****

4.4.4 Interaction of Fee and Commission Income and Non-Deposit Funding on Bank Risk

This sub-section presents results for the impact of the interaction of Fee and Commission income (FINC) and Non-Deposit Funding (NDEPF) on Bank risk (ZSCORE) for Ghanaian banks. In regression, an interaction effect exists when the effect of an independent variable on a dependent variable change, depending on the value(s) of one or more other independent variables. We interact fee and commission income with non-deposit funding, because of deposit market competition and risk based on the bank's classic moral hazard issue of banks (Craig & Dinger, 2013).

Proponents of this perspective claim that the bank's incentives to invest in risky projects are increasing with its financing costs (Allen and Gale, 2000; Hellmann et al., 2000). This argument was initiated by Jensen and Meckling (1976), on the basis of a classical asset substitution problem. If banks are highly funded by debts other than customer deposits, they are incited to invest in riskier projects which promises to bring bank owners high excess returns in beneficial states of the world, while the losses in adverse situations are mainly shifted to the creditors of the bank.

The results from table 4.9 indicate that the interaction effects (**FINC*NDEPF**) has a negative significant effect on bank risk, this implies that as the interaction effects increases the bank risk also increases. This indicates that banks who take in more non-deposit funding but receives more of their income share from fees and commission income become riskier because as they attract more non-deposit funds, they are forced to take more risky investments, and this increases their bank risk.

Table 4.9 Regression Results of Impact of Interaction Between Fee and Commission Income and Non-Deposit Funding on Bank Risk

Variables	Model 3
	ZSCORE
FINC	1.744 (1.75)
NDEPF	7.539 (1.70) ***
INTER (FINC*NDEPF)	-19.421 (4.98) ***
SIZE	0.296 (0.13) **
CAR	32.041 (1.41) ***
ROA	2.127 (0.75) ***
GDP	7.717 (0.80) ***
OWNERSHIP	-0.464 (0.28) *
CONS.	-191.514 (18.48) ***
R ²	0.85
N	238

Coefficients & Standard Errors (in parenthesis) Significant levels at 10%, 5%** & 1%****

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The chapter provides a summary of the results presented and discusses the findings in the study. Also, this chapter provides a conclusion, resulting from the main findings and discussions of the study. Finally, key recommendations stemming from the key findings of the study are presented here. The study suggests recommendations related to policy, practice and further academic research.

5.2 Summary

The study sought to examine how fee income and commission income (FINC) and non-deposit funding made banks riskier, for banks in Ghana comparing local and foreign owned banks. The study further examined how Corporate Governance variables made the banks riskier for both local and foreign banks in Ghana. Finally, the study also examined how the interaction of fee income and commission income (FINC) with non-deposit funding (NDEPF), affected bank risk for banks in Ghana comparing both locally owned and foreign owned.

The study used financial information obtained from annual bank reports and financial statements published in the BankScope database and also the World Development Indicators spanning 10 years between 2006 and 2015. The study employed panel regression model with Breusch-Pagan Test for Heteroscedasticity and Wooldridge test for autocorrelation to examine how fee and commission income (FINC) influenced bank risks of both locally and foreign owned banks in Ghana.

5.3 Summary of Findings of Analysis

The findings of the study indicate that, for banks in Ghana there was no significant relationship exist between fees and commissions' income and bank risk based on analysis of data for the interested period of the study.

However, the finding from the results on the effect of non-deposit funding (NDEPF) as a form of funding strategies on bank risk indicated that there exists a significant positive relationship between non-deposit funding and bank risk for Ghanaian banks. The results imply that banks in Ghana increase their stability by increasing their shares of non-deposit funds as a form of bank funding for their operations. And the for the period under the study, more banks in Ghana were able to utilised short term debts and borrowed liabilities to make them more stable.

Furthermore, the findings showed that the size of the board of directors (BODSIZE) had no significant relationship with bank risk for Ghanaian banks. However, the female presence on the board (BODGEN) reported a significant positive relationship for banks in Ghana. This may be due to the fact that most females are risk adverse and are more likely to advise against banks taking up risky investment.

Again, the findings indicated that, non-executive members of the board (NONEXEC) negatively influenced bank risk of Ghanaian banks at a significant level. This implies that increasing non-executive members of the board will make the bank riskier.

Also, a Chief executive officer (CEODUA) who also serves on the board increases bank stability for banks in Ghana. For CEODUA, the data used had only one foreign bank as a CEO that also served as the board chairman, this finding may not be generalised.

Results for control variables for bank risk indicate that the size of a bank matter in increasing the stability of banks in Ghana significantly only when fee and commission income interacts with non-deposit funding strategies.

Furthermore, the result findings indicate that Capital Asset Ratio (CAR) has a significant positive relationship with bank risk for banks in Ghana. The results imply that Ghanaian banks should increase their capital asset ratios in order to be more stable.

Again, the findings of the study indicate that a significant positive relationship exists between return on assets (ROA) and bank risk for banks in Ghana. As is evident in extant literature and empirical studies, increase in ROA makes banks more stable and less likely to be insolvent.

The findings of the study further show a significant positive relationship between GDP and bank risk for banks in Ghana. This finding implies that, a better Ghanaian economy makes Ghanaian banks more stable. This may be because GDP, as an indicator of economic growth, means that when GDP increases in Ghana, Ghanaians may earn more income and so can save more with banks, and banks may also make more returns in more loans provided.

Finally, though the results indicate that Ghanaian banks are exposed to more risk or are generally risky, ownership of banks have a significant impact on bank risk with locally owned banks being riskier than foreign owned banks. This has been observed in extant literature to be the normal especially in banking sector of developing economies.

5.4 Conclusion

The study used financial information of 30 Ghanaian banks to draw conclusions based on robust results, using the panel regression model. The robustness of the regression model makes the conclusions drawn from the result more representative of Ghana banks. The study concludes that non-deposit funding can make Ghanaian banks more stable at significant levels. Thus, banks in Ghana can benefit from capital from wholesale financiers and money markets to finance their income generating activities especially when customer deposits are low.

From the findings about the Corporate Governance variables and its effects on bank risk, the study concludes that the presence of females on the board have a positive effect on bank in the Ghana. More women should be added to board of directors of Ghanaian banks. From this study, we can conclude that increasing non-executive directors of bank boards, negatively affect bank risk for banks. This maybe because in Ghana, non-executive directors have been known to often influence the quality of loans made by banks. Furthermore, by this study, we can conclude that chief executive officers who also serve on the board of directors help to increase their bank stability by reducing their bank risk. Because by being on the board, they are able to better articulate the strategies of the bank and also meet the aspirations of the board, solving the age-old agency theory issues.

It can be concluded from this study that Capital Asset Ratio (CAR) has positive effect on bank risk for banks in Ghana and therefore Ghanaian banks should increase their capital asset ratios in order to be more stable. Ghanaian banks should invest in income generating activities that bring more return on asset, since it can be concluded from this study among many other studies that return on assets has a positive relationship with bank risk for banks in Ghana.

Again, it can be concluded from the findings of the study that (GDP) gross domestic products of a country positively influences bank risk for banks, and finally, by the results of this study, it can be concluded that Ghanaian banks are exposed to more risk or are generally risky, and also that though banks in Ghana are risky, locally owned banks are riskier than foreign owned banks in the Ghanaian banking sector.

5.5 Recommendations

The findings of this study suggest recommendations to address policy, business practices and academic research for how fees and commission income influences bank risk. For policy makers, the study proposes that among other recommendations, regulators should provide guideline on how banks appoint members to their boards among other corporate governance issues. Also, it should be recommended or required that the ratio of female board members be increased as much as possible on the boards of Ghanaian banks. Bank regulators and supervisors should require banks to increase their minimum capital asset ratios as it has been shown to increase bank stability and reduce bank risk.

Again, as a recommendation for banks, as banks increase their size, they need to adapt best asset management tools and practices. Asset risk managers, enterprise risk managers and committees should be constituted by the banks to them help in decision making processes as to the type of assets acceptable by the banks.

Finally, the study recommends for further academic studies into how corporate governance variables such as board size and independent audit committee of banks and external auditors of banks influence bank risk. Given that external auditors of banks are expected to help reduce bank risk but seem to have no significant effects on bank risk for Ghanaian banks by this study, a further

research is required especially with focus on the works and reporting of external auditors. The accuracy and authenticity of financial statement of banks audited by top auditing firms in Ghana need to be investigated, especially for the Ghanaian banking industry. This will help examine how these variables affect bank risk in Ghanaian banks.

REFERENCES

- Abedifar, P., Molyneux, P., & Tarazi, A. (2014). Non-Interest Income Activities and Bank Lending.
- Aboagye, A. Q. Q., & Ahenkora, E. (2017). Stress Testing Exposure of Banks to Sectors of the Ghanaian Economy. *Journal of African Business*, 19(1), 27–38. <https://doi.org/10.1080/15228916.2017.1342180>
- Abobakr, M. G., & Elgiziry, K. (2017). The relationship between board of directors' characteristics and bank risk-taking: Evidence from Egyptian banking sector. *Journal of Finance and Accounting*, 5(1), 24-33.
- Acharya, V. V., Hasan, I., & Saunders, A. (2006). Should Banks Be Diversified? Evidence from Individual Bank Loan Portfolios*. *The Journal of Business*, 79(3), 1355–1412. <https://doi.org/10.1086/500679>
- Adeabah, D., Gyeke-Dako, A., & Andoh, C. (2019). Board gender diversity, corporate governance and bank efficiency in Ghana: a two-stage data envelope analysis (DEA) approach. *Corporate Governance: The International Journal of Business in Society*.
- Adjei, E. A., & Chakravarty, S. P. (2012). Banking industry liberalisation in Ghana. *Journal of Advanced Research*, 2(2), 93–99. <https://doi.org/10.1016/j.rdf.2012.01.006>
- Adusei, M. (2015). The impact of bank size and funding risk on bank stability. *Cogent Economics & Finance*, 3(1), 1111489.
- Adzobu, L. D., Agbloyor, E. K., & Aboagye, A. Q. Q. (2016). The effect of loan portfolio diversification on banks' risks and return: evidence from an emerging market. *Managerial Finance*. <https://doi.org/10.1108/09574090910954864>
- Ajibo, K. I. (2015). Risk-based regulation: The future of Nigerian banking industry. *International Journal of Law and Management*, 57(3), 201–216. <https://doi.org/10.1108/IJLMA-02-2014-0014>

- Akbar, S., Kharabsheh, B., Poletti-Hughes, J., & Shah, S. Z. A. (2017). Board structure and corporate risk taking in the UK financial sector. *International Review of Financial Analysis*, 50, 101–110. <https://doi.org/10.1016/j.irfa.2017.02.001>
- Alhassan, A. L., & Tetteh, M. L. (2017). Non-interest income and bank efficiency in Ghana: a two-stage DEA bootstrapping approach. *Journal of African Business*, 18(1), 124-142.
- Amidu, M. (2007). Determinants of capital structure of banks in Ghana: an empirical approach. *Baltic Journal of Management*, 2(1), 67–79. <https://doi.org/10.1108/17465260710720255>
- Amidu, M. (2013). The effects of the structure of banking market and funding strategy on risk and return. *International Review of Financial Analysis*, 28, 143–155. <https://doi.org/10.1016/j.irfa.2013.03.001>
- Amidu, M., & Harvey, S. K. (2016). The persistence of profits of banks in Africa. *Review of Quantitative Finance and Accounting*, 47(1), 83-108.
- Amuakwa–Mensah, F., & Boakye–Adjei, A. (2015). Determinants of non–performing loans in Ghana banking industry. *International Journal of Computational Economics and Econometrics*, 5(1), 35-54.
- Anginer, D., & Demirguc-Kunt, A. (2018). *Bank runs and moral hazard: A review of deposit insurance*. The World Bank.
- Anginer, D., Demirguc-Kunt, A., & Zhu, M. (2014). How does competition affect bank systemic risk? *Journal of Financial Intermediation*, 23(1), 1–26. <http://doi.org/10.1016/j.jfi.2013.11.001>
- Anin, T. E. (2000). *Banking in Ghana*. Woeli Pub Serv.
- Ansah-Addo, L. (2015). Does Non-Interest Income Make Banks Riskier? Retail Vs Investment Banking Activities in Africa. University of Ghana. Retrieved from <http://ugspace.ug.edu.gh>

- Apanga, M. A. N., Appiah, K. O., & Arthur, J. (2016). Credit risk management of Ghanaian listed banks. *International Journal of Law and Management*, 58(2), 162–178. <https://doi.org/10.1108/IJLMA-04-2014-0033>
- Appiah, M. A. (2001). 'Failures in Ghana: the experience of rural banks. *MBA Long Essay, University of Ghana Business School, Accra.*
- Asanović, Ž. (2018). An Analysis of the Determinants of Systemic Banking Crises in Southeast European Countries. *Journal of Central Banking Theory and Practice*, 7(2), 165-186.
- Ashraf, D., Ramady, M., & Albinali, K. (2016). Financial fragility of banks, ownership structure and income diversification: Empirical evidence from the GCC region. *Research in International Business and Finance*, 38, 56–68. <https://doi.org/10.1016/j.ribaf.2016.03.010>
- Aye, G. C., Balcilar, M., Demirer, R., & Gupta, R. (2018). Firm-level political risk and asymmetric volatility. *The Journal of Economic Asymmetries*, 18, e00110.
- Ayuso, J., Pérez, D., & Saurina, J. (2004). Are capital buffers pro-cyclical? Evidence from Spanish panel data. *Journal of financial intermediation*, 13(2), 249-264.
- Bajada, C., & Trayler, R. (2015). Technology-driven service innovation in the banking industry. In *The handbook of service innovation* (pp. 319-343). Springer, London.
- Ballester, L., Casu, B., & González-Urteaga, A. (2016). Bank fragility and contagion: Evidence from the bank CDS market. *Journal of Empirical Finance*, 38, 394-416.
- Battaglia, F., & Gallo, A. (2017). Strong boards, ownership concentration and EU banks' systemic risk-taking: Evidence from the financial crisis. *Journal of International Financial Markets, Institutions and Money*, 46, 128-146.
- Bello Dogarawa, A. (2011). Chronology of banking reforms in Nigeria: A survey of past and present theoretical and empirical literature. *Journal of Financial Regulation and Compliance*. <https://doi.org/10.1108/13581981111182965>

- Bendickson, J., Muldoon, J., Liguori, E. W., & Davis, P. E. (2016). Agency theory: background and epistemology. *Journal of Management History*.
- Bluhm, M., Georg, C. P., & Krahn, J. P. (2016). Interbank intermediation.
- Bokpin, G. A. (2013). Ownership structure, corporate governance and bank efficiency: an empirical analysis of panel data from the banking industry in Ghana. *Corporate Governance: The International Journal of Business in Society*, 13(3), 274–287. <https://doi.org/10.1108/CG-05-2010-0041>
- Bokpin, G. A., & Arko, A. C. (2009). Ownership structure, corporate governance and capital structure decisions of firms. *Studies in Economics and Finance*, 26(4), 246–256. <https://doi.org/10.1108/10867370910995708>
- Bouzgarrou, H., Jouida, S., & Louhichi, W. (2018). Bank profitability during and before the financial crisis: Domestic versus foreign banks. *Research in International Business and Finance*, 44, 26-39.
- Calmès, C., & Liu, Y. (2009). Financial structure change and banking income: A Canada–US comparison. *Journal of International Financial Markets, Institutions and Money*, 19(1), 128-139.
- Chen, Y. C., Chiu, Y. H., Huang, C. W., & Tu, C. H. (2013). The analysis of bank business performance and market risk—Applying Fuzzy DEA. *Economic modelling*, 32, 225-232.
- Chronopoulos, D. K., Liu, H., McMillan, F. J., & Wilson, J. O. (2015). The dynamics of US bank profitability. *The European Journal of Finance*, 21(5), 426-443.
- Craig, B. R., & Dinger, V. (2013). Deposit market competition, wholesale funding, and bank risk. *Journal of Banking and Finance*, 37(9), 3605–3622. <https://doi.org/10.1016/j.jbankfin.2013.05.010>

- Curi, C., Lozano-Vivas, A., & Zelenyuk, V. (2015). Foreign bank diversification and efficiency prior to and during the financial crisis: Does one business model fit all? *Journal of Banking & Finance*, 61, S22-S35.
- Cuypers, I. R., Cuypers, Y., & Martin, X. (2017). When the target may know better: Effects of experience and information asymmetries on value from mergers and acquisitions. *Strategic Management Journal*, 38(3), 609-625.
- Dahir, M. A., Mahat, F. B., & Bin Ali, N. A. (2018). Funding liquidity risk and bank risk-taking in BRICS countries an application of system GMM approach. *International Journal of Emerging Markets*, 13(1), 231–248. <https://doi.org/10.1108/IJoEM-03-2017-0086>
- Damankah, B. S., Anku-Tsedee, O., & Amankwaa, A. (2014). Analysis of non-interest income of commercial banks in Ghana. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 4(4), 263-271.
- Damar, H. E., Meh, C. A., & Terajima, Y. (2013). Leverage, balance-sheet size and wholesale funding. *Journal of Financial Intermediation*, 22(4), 639-662.
- De Haas, R., & Van Lelyveld, I. (2014). Multinational banks and the global financial crisis: Weathering the perfect storm? *Journal of Money, Credit and Banking*, 46(s1), 333-364.
- De Jonghe, O. (2008). *The impact of revenue diversity on banking system stability*. Centro Stampa Banca d'Italia.
- Deli, Y. D., & Hasan, I. (2017). Real effects of bank capital regulations: Global evidence. *Journal of Banking & Finance*, 82, 217-228.
- Demirguc-Kunt, A., & Huizinga, H. (2010). Bank activity and funding strategies: The impact on risk and returns. *Journal of Financial Economics*, 98, 626–650. <https://doi.org/10.1016/j.jfineco.2010.06.004>

- Doan, A.T., Lin, K.L. and Doong, S.C. (2018), “What drives bank efficiency? The interaction of bank income diversification and ownership”, *International Review of Economics & Finance*, Vol. 55, pp. 203-219.
- Edirisuriya, P., Gunasekarage, A., & Dempsey, M. (2015). Australian Specific Bank Features and the Impact of Income Diversification on Bank Performance and Risk. *Australian Economic Papers*, 54(2), 63-87.
- Fosu, S. (2013). Capital structure, product market competition and firm performance: Evidence from South Africa. *The quarterly review of economics and finance*, 53(2), 140-151.
- Fosu, S., Danso, A., Ahmad, W., & Coffie, W. (2016). Information asymmetry, leverage and firm value: Do crisis and growth matter? *International Review of Financial Analysis*, 46, 140-150.
- Frame, W. S., & White, L. J. (2014). *Technological change, financial innovation, and diffusion in banking* (pp. 1-5). Leonard N. Stern School of Business, Department of Economics.
- Funso, T. K., Kolasde, A.R., and Ojo, O.M. (2012), “Credit Risk and Commercial Banks’ Performance in Nigeria: A Panel Model Approach”, *Australian Journal of Business and Management Research*, 2(2), 31-38
- George, A. (1970). The market for ‘Lemons’: Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84(3), 488-500.
- Ghosh, A. (2016). Banking sector globalization and bank performance: A comparative analysis of low-income countries with emerging markets and advanced economies. *Review of Development Finance*, 6(1), 58-70.
- Goddard, J., Liu, H., Molyneux, P., & Wilson, J. O. (2013). Do bank profits converge? *European Financial Management*, 19(2), 345-365.
- Gonzalez Sanchez, M., & Morales de Vega, M. E. (2018). Corporate reputation and firms' performance: Evidence from Spain. *Corporate Social Responsibility and Environmental Management*, 25(6), 1231-1245.

- Guerry, N., & Wallmeier, M. (2017). Valuation of diversified banks: New evidence. *Journal of Banking & Finance*, 80, 203-214.
- Gugler, K., & Peev, E. (2018). The persistence of profits in banking: an international comparison. *Applied Economics*, 50(55), 5996-6009.
- Haider, Z.A., Liu, M., Wang, Y. and Zhang, Y. (2018), "Government ownership, financial constraint, corruption, and corporate performance: International evidence", *Journal of International Financial Markets, Institutions and Money*, Vol. 53, pp. 76-93.
- Haque, F., & Shahid, R. (2016). Ownership, risk-taking and performance of banks in emerging economies Evidence from India. *Journal of Financial Economic Policy*, 8(3), 282–297. <https://doi.org/10.1108/JFEP-09-2015-0054>
- Hassan, M. K., Unsal, O., & Emre, H. (2016). Borsa _ Istanbul Review Risk management and capital adequacy in Turkish participation and conventional banks: A comparative stress testing analysis *. *Borsa Istanbul Review*. <http://doi.org/10.1016/j.bir.2016.04.001>
- Huang, R., & Ratnovski, L. (2011). The dark side of bank wholesale funding. *Journal of Financial Intermediation*, 20(2), 248–263. <https://doi.org/10.1016/j.jfi.2010.06.003>
- Khan, M. S., Scheule, H., & Wu, E. (2017). Funding liquidity and bank risk taking. *Journal of Banking and Finance*, 82, 203–216. <https://doi.org/10.1016/j.jbankfin.2016.09.005>
- Köhler, M. (2015). Which banks are riskier? The impact of business models on bank stability. *Journal of Financial Stability*, 16, 195-212.
- Kuranchie-Pong, L., Bokpin, G. A., & Andoh, C. (2016). Empirical evidence on disclosure and risk-taking of banks in Ghana. *Journal of Financial Regulation and Compliance*, 24(2), 197–212. <https://doi.org/10.1108/JFRC-05-2015-0025>
- Kyereboah-Coleman, A., & Biekpe, N. (2006). The relationship between board size, board composition, CEO duality and firm performance: Experience from Ghana. *Corporate Ownership and Control*, 4(2), 114-122.

- Laeven, L., & Levine, R. (2007). Is there a diversification discount in financial conglomerates? *Journal of financial economics*, 85(2), 331-367.
- Lassoued, N., Sassi, H., Ben, M., & Attia, R. (2016). The impact of state and foreign ownership on banking risk: Evidence from the MENA countries. *Research in International Business and Finance*, 36, 167–178.
- Lee, C. C., Hsieh, M. F., & Yang, S. J. (2014). The relationship between revenue diversification and bank performance: Do financial structures and financial reforms matter? *Japan and the World Economy*, 29, 18-35.
- Lengwiler, Y., Maringer, D., 2015. Regulation and contagion of banks. *J. Bank Regul.* 16 (1), 64– 71.
- Lensink, R., & Hermes, N. (2004). The short-term effects of foreign bank entry on domestic bank behaviour: Does economic development matter? *Journal of Banking & Finance*, 28(3), 553-568.
- Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). Bank income structure and risk: An empirical analysis of European banks. *Journal of banking & finance*, 32(8), 1452-1467.
- Li, L., & Zhang, Y. (2013). Are there diversification benefits of increasing noninterest income in the Chinese banking industry? *Journal of Empirical Finance*, 24, 151-165.
- Meslier, C., Tacneng, R., & Tarazi, A. (2014). Is bank income diversification beneficial? Evidence from an emerging economy. *Journal of International Financial Markets, Institutions and Money*, 31(1), 97–126. <https://doi.org/10.1016/j.intfin.2014.03.007>
- Mohammed, S. A. S. A. N., & Muhammed, J. (2017). The relationship between agency theory, stakeholder theory and Shariah supervisory board in Islamic banking. *Humanomics*.
- Mostak Ahamed, M. (2017). Asset quality, non-interest income, and bank profitability: Evidence from Indian banks. *Economic Modelling*, 63(February), 1–14. <https://doi.org/10.1016/j.econmod.2017.01.016>

- Moudud-Ul-Huq, S., Ashraf, B. N., Gupta, A. D., & Zheng, C. (2018). Does bank diversification heterogeneously affect performance and risk-taking in ASEAN emerging economies? *Research in International Business and Finance*, 46, 342-362.
- Mun, T. S. (2015). *The Politics of the Asian Infrastructure Investment Bank (AIIB)*. ISEAS.
- Narwal, K.P. and Pathneja, S. (2016), "Effect of bank-specific and governance-specific variables on the productivity and profitability of banks", *International Journal of Productivity and Performance Management*, Vol. 65 No. 8, pp. 1057-1074.
- Neaime, S. (2016). Financial crises and contagion vulnerability of MENA stock markets. *Emerging Markets Review*, 27, 14-35.
- Norden, L., & Weber, M. (2010). Funding modes of German banks: structural changes and their implications. *Journal of Financial Services Research*, 38(2-3), 69-93.
- Obuobi, B., Nketiah, E., Awuah, F., & Amadi, A. G. (2019). Recapitalization of Banks: Analysis of the Ghana Banking Industry. *Open Journal of Business and Management*, 8(01), 78.
- Ofoeda, I., Gariba, P., & Amoah, L. (2016). Regulation and performance of non-bank financial institutions in Ghana. *International Journal of Law and Management*.
- Özek, P. (2017). Non-Traditional Activities and Funding Structures: An Analysis of Commercial Banks in Turkey. *International Journal of Economic & Administrative Studies*, (18).
- Palvia, A., Vähämaa, E., & Vähämaa, S. (2015). Are female CEOs and chairwomen more conservative and risk averse? Evidence from the banking industry during the financial crisis. *Journal of Business Ethics*, 131(3), 577-594.
- Pennathur, A. K., Subrahmanyam, V., & Vishwasrao, S. (2012). Income diversification and risk: Does ownership matter? An empirical examination of Indian banks. *Journal of Banking and Finance*, 36(8), 2203–2215.
<https://doi.org/10.1016/j.jbankfin.2012.03.021>

- Quick, R., & Schmidt, F. (2018). Do audit firm rotation, auditor retention, and joint audits matter? – An experimental investigation of bank directors' and institutional investors' perceptions. *Journal of Accounting Literature*, 41(January), 1–21.
<https://doi.org/10.1016/j.acclit.2018.01.003>
- Ratnovski, L. (2013). Liquidity and transparency in bank risk management. *Journal of Financial Intermediation*, 22(3), 422-439.
- Sarpong-Kumankoma, E., Abor, J., Aboagye, A. Q., & Amidu, M. (2018). Differences in bank profit persistence in Sub-Saharan Africa. *African Journal of Economic and Management Studies*.
- Sawada, M. (2013). How does the stock market value bank diversification? Empirical evidence from Japanese banks. *Pacific-Basin Finance Journal*, 25, 40-61.
- Shim, J. (2019). Loan portfolio diversification, market structure and bank stability. *Journal of Banking & Finance*, 104, 103-115.
- Sissy, A. M., Amidu, M., & Abor, J. Y. (2017). The effects of revenue diversification and cross border banking on risk and return of banks in Africa. *Research in International Business and Finance*, 40, 1–18. <https://doi.org/10.1016/j.ribaf.2016.09.017>
- Stiroh, K. J. (2004). Diversification in Banking: Is Noninterest Income the Answer? *Journal of Money, Credit, and Banking*, 36(5), 853–882. <https://doi.org/10.1353/mcb.2004.0076>
- Terraza, V. (2015). The effect of bank size on risk ratios: Implications of banks' performance. *Procedia Economics and Finance*, 30, 903-909.
- Tsamenyi, M., Enninful- Adu, E., & Onumah, J. (2007). Disclosure and corporate governance in developing countries: Evidence from Ghana. *Managerial Auditing Journal*.
- Vo, X. V. (2018). Bank lending behavior in emerging markets. *Finance Research Letters*, 27, 129-134.

- Wang, T., & Hsu, C. (2013). Board composition and operational risk events of financial institutions. *Journal of Banking & Finance*, 37(6), 2042-2051.
- Williams, B., & Prather, L. (2010). Bank risk and return: the impact of bank non-interest income, 6(3), 220–244. <https://doi.org/10.1108/17439131011056233>
- Witzany, J. (2017). Credit Risk Management. In *Credit Risk Management* (pp. 5-18). Springer, Cham.
- Wu, J., Chen, M., Jeon, B. N., & Wang, R. (2017). Does foreign bank penetration affect the risk of domestic banks? Evidence from emerging economies. *Journal of Financial Stability*, 31, 45–61. <https://doi.org/10.1016/j.jfs.2017.06.004>
- Xu, Y. (2011). Towards a more accurate measure of foreign bank entry and its impact on domestic banking performance: The case of China. *Journal of Banking & Finance*, 35(4), 886-901.
- Yasser, Q. R., & Al Mamun, A. (2015). The impact of CEO duality attributes on earnings management in the East. *Corporate Governance*.
- Yeung, W. H., & Lento, C. (2018). Ownership structure, audit quality, board structure, and stock price crash risk: Evidence from China. *Global Finance Journal*, 37(October 2017), 1–24. <https://doi.org/10.1016/j.gfj.2018.04.002>

APPENDICES

Appendix 1: List of Both Local and Foreign Banks Considered in The Study

Local		Foreign	
Name	Number	Name	Number
Agricultural Development Bank	1	Access Bank	1
Cal Bank	2	Bank of Africa	2
First Capital Bank	3	Bank of Baroda	3
Fidelity Bank		Banque Sahélo-Saharienne Pour l'Investissement Et Le Commerce	4
First Atlantic Bank	5	Barclays Bank	5
Ghana Commercial Bank	6	Ecobank	6
Group Ndoum Bank	7	Energy Bank	7
Home Finance Company Bank	8	FBNbank	8
National Investment Bank	9	First National Bank	9
Omnibank Ghana	10	Guaranty Trust Bank	10
Prudential Bank	11	Societe General	11
The Royal Bank	12	Stanbic Bank	12
Unibank	13	Standard Chartered Bank	13
Unique Trust Bank	14	United Bank for Africa	14
Universal Merchant Bank	15	Zenith Bank	15

Appendix 2: Testing for No Multicollinearity of Variables

A variance inflation factor is conducted for the ZSCORE model to test for multicollinearity among the variables. From the VIF results below, for both local and foreign banks none of the variables have VIF values that exceeded the threshold of 10 to regard as highly correlational hence all variables are used in the regression analysis.

Appendix Table 2: Variance Inflation Factor

VARIABLE	VIF	1/VIF
SIZE	2.1	0.4753
GDP	1.95	0.51322
OWNERSHIP	1.79	0.55763
BODSIZE	1.68	0.59541
CAR	1.62	0.61873
AUDITOR	1.56	0.63965
BODGEN	1.45	0.68864
FINC	1.44	0.69532
CEODUA	1.36	0.73543
NDEPF	1.18	0.84524
NONEXEC	1.12	0.89257
ROA	1.1	0.9085
Mean VIF	1.53	

Appendix 4: Normality Test

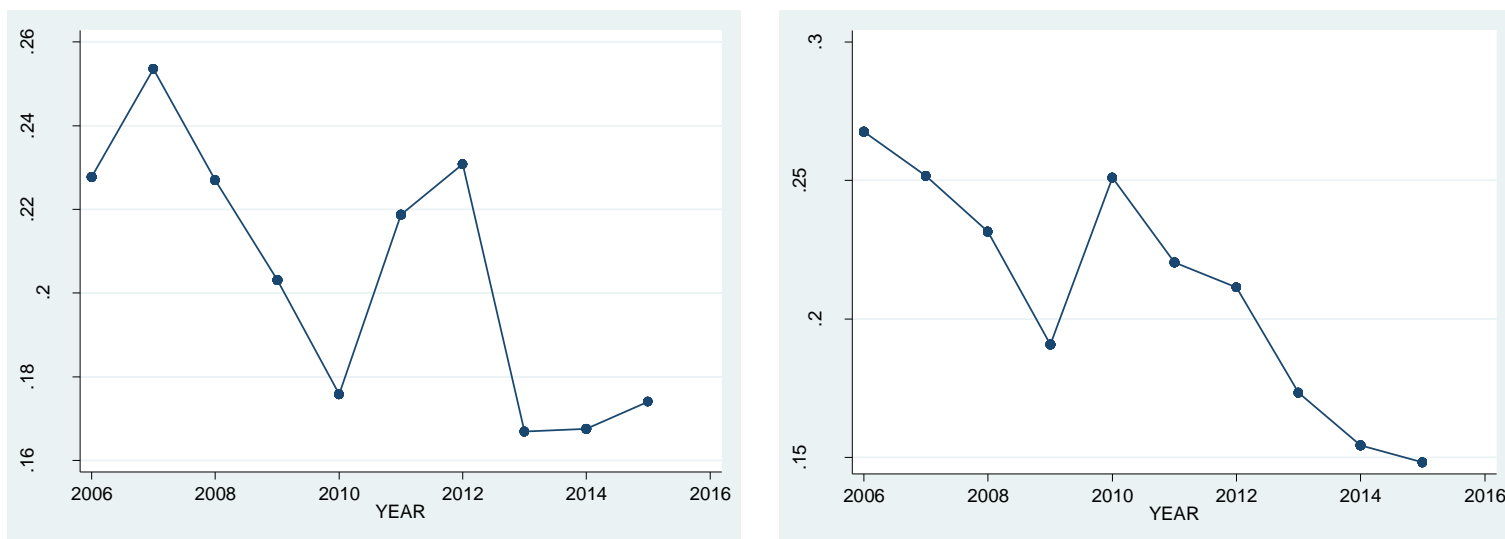
The Shapiro- Wilk W test was conducted to ascertain the normality of the data. From the results below, BODSIZE, AUDITOR and OWNERSHIP appears not to be normally distributed for data of banks in Ghana as they have their Prob>z to be more than 0.10. All the other variables considered appear to be normally distributed as the Prob>z is less than 0.10.

Appendix Table 3: Shapiro- Wilk W test for normality

VARIABLE	OBS	W	V	Z	PROB>Z
ZSCORE	239	0.85236	25.738	7.540	0.00000
SIZE	239	0.89712	17.935	6.702	0.00000
FINC	239	0.98544	2.538	2.162	0.01529
NDEPF	239	0.82674	30.205	7.912	0.00000
CAR	239	0.70341	51.705	9.159	0.00000
ROA	239	0.11118	154.949	11.707	0.00000
GDP	300	0.94238	12.276	5.886	0.00000
AUDITOR	245	0.99788	0.377	-2.266	0.98827
CEODUA	237	0.97160	4.914	3.695	0.00011
BODSIZE	237	0.99432	0.983	-0.039	0.51573
NONEXEC	237	0.98095	3.297	2.768	0.00282
BODGEN	237	0.98126	3.243	2.730	0.00317
OWNERSHIP	300	0.99971	0.062	-6.534	1.00000

Appendix 5: Changing Trends in Fees and Commission Income: Local (Left) vs Foreign (Right)

Figure 1 Dynamics in Fees and Commission Income, Local (left) vs Foreign (Right)



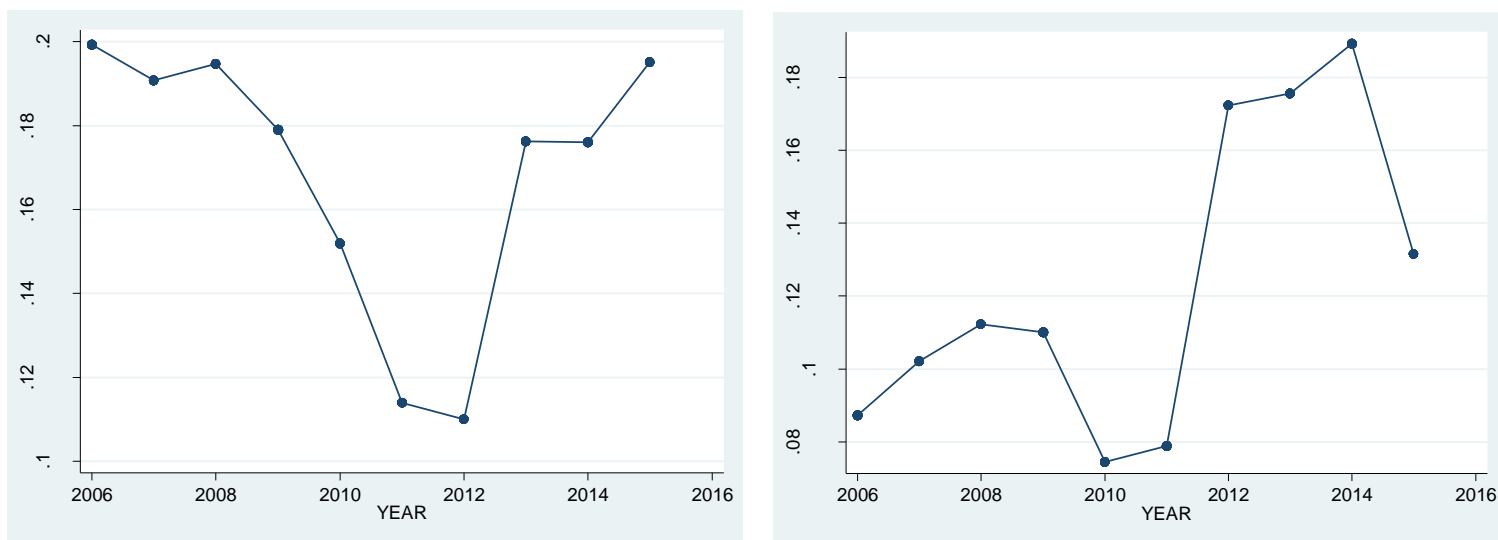
Avgfinc= Average Fees and Commission Income

Fig. 1. Trend of the fee income share. The fee income share is the share of noninterest income in total operating income. This figure displays the trend of the fee income share from 2006 to 2015. The fee income share data are yearly averages. The data are from Bankscope.

From the figure above, it can be observed that, while foreign banks generally have reduced their shares of income generated from fees and commission over time, local banks seem to fluctuate the shares of income generated from fees and commissions over time. Comparably foreign banks had a lower share of income generated from fees and commission than local banks. This is an indication of the ability of foreign banks to generate more assets in terms of loans provided than local banks.

Appendix 6: Changing Trends in Non-Deposit Funding: Local (Left) vs Foreign (Right)

Figure 2 Dynamics in Non-Deposit Funding: Local (Left) vs Foreign (Right)



Avgnondepfund= Average Non-Deposit Funding

Fig. 2. Trend of the non-deposit funding share. **The non-deposit funding share is the share of non-deposit short-term funding in total deposits and short-term funding. This figure displays the trend of the non-deposit funding share from 2006 to 2015. The non-deposit funding share data are yearly averages. Data are from Bankscope.**

From figure 2 above, it can be observed that, local banks have had a reduction in the shares of their activities funded by non- customer deposit, while foreign banks have had an increase in the shares of their activities funded by non- customer deposit over time. Though local banks seem to attract more non-deposit funding compared to foreign banks. This maybe an indication of the unreliability of local banks to secure more customer deposit, requiring them to seek other forms of liability to fund their activities.

Appendix 7: Changing Trends in Return on Asset: Local (Left) vs Foreign (Right)

Figure 3 Dynamics in Return on Asset: Local (Left) vs Foreign (Right)



Avgroa= Average Return on Assets

Fig. 3. Trend of the Return on assets. The Return on assets is pre-tax profits divided by total assets. This figure displays the trend of the Return on assets from 2006 to 2015. The Return on assets data are yearly averages. The data are from Bankscope.

From figure 3, it can be observed that, while foreign banks appear to be reporting a steady increase in the average rate of return on assets over time, local banks are reporting a fluctuating rate of return on assets over time. This maybe an indication of good asset quality or effective and efficient cost of operation management on the part of foreign banks than that of the local banks. It can be seen that, foreign banks on the whole have a higher average of return on assets than local banks.