

**UNIVERSITY OF GHANA**

**THE AGENCY THEORETICAL EXPLANATION OF BANK INTEREST RATE  
SPREADS IN AFRICA**

**AGYEMAN BENJAMIN**

**(10441672)**

**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN  
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF  
MPHIL FINANCE DEGREE**

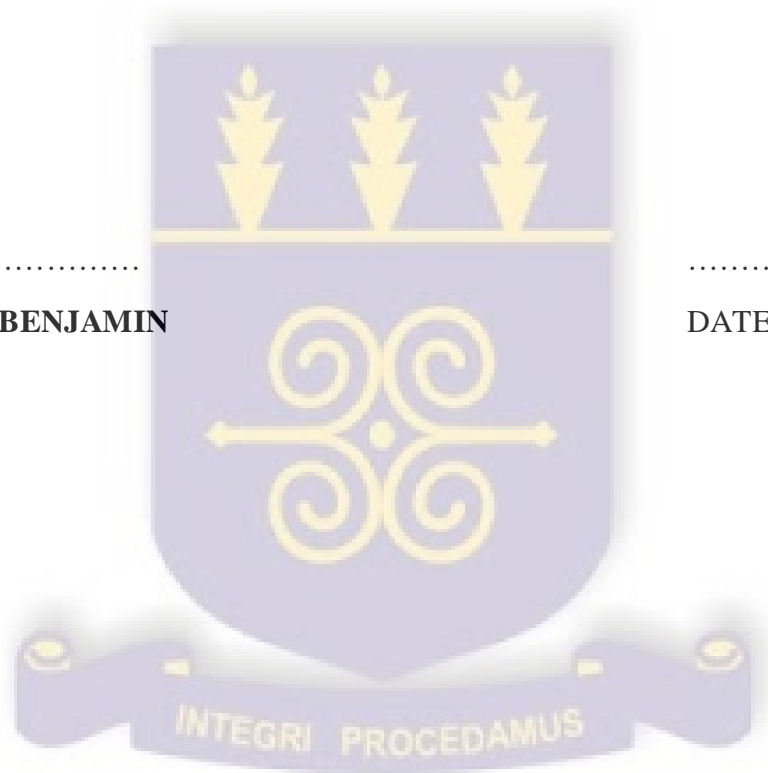
**JUNE 2015**

## DECLARATION

I, Agyeman Benjamin, do hereby declare that this thesis is a result of my own work and has not been presented for academic award at this university or any other academic institution. All references in the work have been duly acknowledged. I, therefore, declare my full responsibility for any shortcomings in the document.

.....  
**AGYEMAN BENJAMIN**  
  
(STUDENT)

.....  
DATE



**CERTIFICATION**

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

.....

**PROF. ANTHONY Q.Q ABOAGYE**  
(SUPERVISOR)

.....

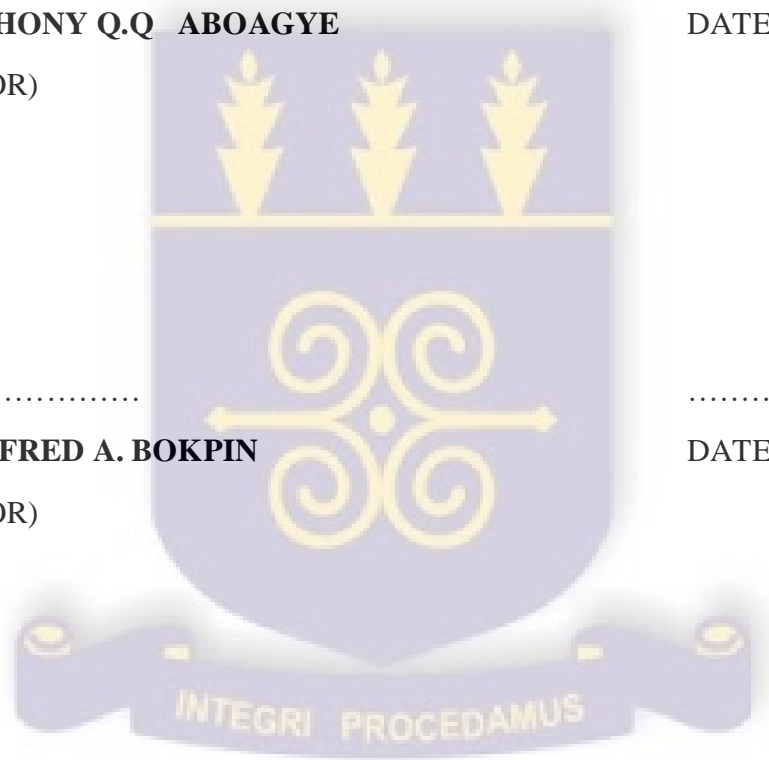
DATE

.....

**PROF. GODFRED A. BOKPIN**  
(SUPERVISOR)

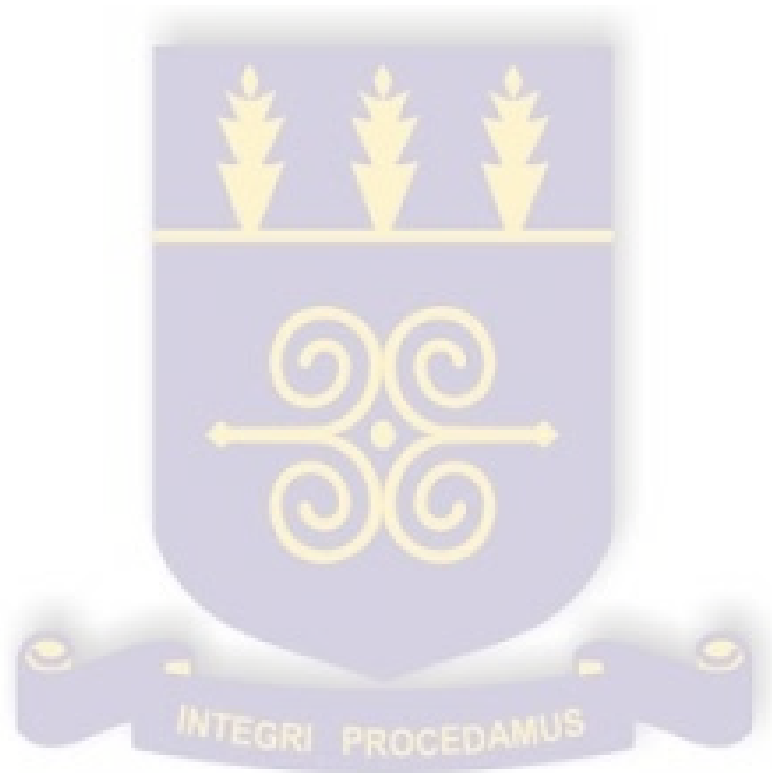
.....

DATE



## DEDICATION

I dedicate this work to the Almighty God and all my family members, especially my wonderful boys. God bless you all. Amen.



## ACKNOWLEDGEMENTS

Writing this thesis has involved numerous people and organizations, whose contributions are gratefully acknowledged. First of all, I thank God Almighty for the gift of life and everything else. I really appreciate the favour and mercy which have brought me to this far.

I owe profound gratitude to my primary supervisor, Professor Anthony Q.Q. Aboagye for his most constructive comments, suggestions and encouragement that made the production of this thesis possible. To my second supervisor, Prof. Godfred A. Bokpin, I say very big thank you for your immense support through the selection of the topic, the data collection and the entire work. In fact, this work would have been a mirage had it not been the assistance I received from you. Other faculty members are acknowledged here for their important suggestions during the presentation sections.

To my colleagues on the M.Phil. Programme especially Lawrence, Baah, Jabir Mohammed and to all those who played various roles during my studies. May God bless you, all. I owe my deepest appreciation to Rev. Sister Agnes Adongo (The Headmistress of OLL Girls' SHS, Navrongo), my Parents, and other family members, especially Agyemang Asirifi Isaac for their prayers and other forms of assistance granted me during this period.

My last thanks goes to my dearest companion, Millicent Achibase and our boys for their prayers, financial support and encouragement. May the Almighty God bless you all.

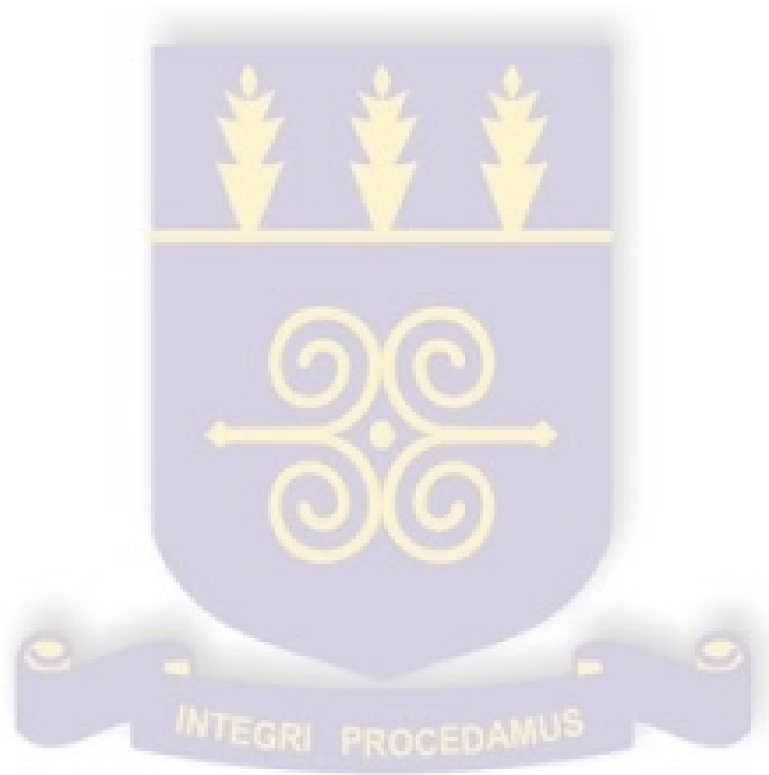
## TABLES OF CONTENTS

Contents	Page
DECLARATION .....	i
CERTIFICATION .....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENTS .....	iv
TABLES OF CONTENTS.....	v
LISTS OF TABLES .....	ix
LIST OF FIGURES .....	x
LIST OF ACRONYMS/ABBREVIATIONS .....	xi
ABSTRACT .....	xiii
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1 Background to the Study .....	1
1.2 Problem Statement.....	11
1.3 Objectives of the study .....	14
1.4 Research Questions.....	14
1.5 Hypotheses .....	15
1.6 Methodology .....	15
1.7 Significance of the Research.....	16
1.8 Research Scope and Limitation .....	16
1.9 Chapter Outline.....	17
CHAPTER TWO .....	18
LITERATURE REVIEW .....	18
2.1 Introduction.....	18
2.2 Agency Theory and the Agency Problem/Costs.....	18
2.3 Ways of Mitigating the Agency Problems .....	20
2.3.1 Executive Compensation.....	20
2.3.2 Board of Directors/Board Composition .....	21
2.3.3 Ownership Structure (Foreign or Local/Public) .....	22
2.4 Bank Interest Rate Spread.....	22
2.5 Theories of Interest Rate Spread.....	23

2.5.1	Keynesian Liquidity Preference Theory.....	23
2.5.2	Adverse Selection Theory .....	23
2.6	The Determinants of Interest Rate Spread .....	24
2.6.1	Macroeconomic Variables/ Environment.....	24
2.6.1a	Inflation.....	24
2.6.1b	Treasury Bills (T-bills).....	25
2.6.1c	Interest Rate .....	25
2.6.2	Bank Specific Variables .....	25
2.6.2a	Bank credit risk.....	26
2.6.2b	Bank Size .....	26
2.6.2c	Quality of Management/Bank Management Efficiency .....	27
2.6.3	Market Structure.....	27
2.6.4	Regulatory Factors .....	27
2.6.4a	Reserve Requirement .....	27
2.6.4b	Management Risk Aversion (The Degree of Risk Aversion) .....	28
2.7	Empirical Studies on Agency Theory/Costs.....	28
2.8	Empirical Studies on Interest Rate Spread/Net Interest Margin.....	31
CHAPTER THREE .....		44
METHODOLOGY .....		44
3.1	Introduction.....	44
3.2	Sample .....	44
3.3	Data Sources.....	44
3.4	Description of Variables .....	45
3.4.1	Dependent Variables.....	45
3.4.1.1	Interest Rate Spread .....	45
3.4.2	The Independent Variables .....	45
3.4.3.1	Agency Cost Variables .....	45
3.4.3.1a	Emolument.....	45
3.4.3.1b	Board Composition .....	46
3.4.3.1c	Ownership Structure of the Banks.....	46
3.4.3.2	Bank Specific Variables.....	47
3.4.3.2a	Bank Size .....	47
3.4.3.2b	Quality of Management (Management Inefficiency) .....	47
3.4.3.2c	Credit Risk .....	48

3.4.3.3 Macroeconomic Factors.....	48
3.4.3.3a Inflation Rate .....	48
3.4.3.3b Interest Rates Volatility .....	49
3.4.3.3c Exchange Rate .....	49
3.4.3.4 Regulatory Factors .....	49
3.4.3.4a Bank Risk-Aversion .....	50
3.4.3.4b Reserve Requirement .....	50
3.4.3.5 Industrial Specific Factor.....	51
3.5 Model Specification .....	53
3.6 Estimation Strategy .....	55
3.7 Conclusion .....	56
CHAPTER FOUR .....	57
RESULTS AND DISCUSSIONS.....	57
4.1 Introduction.....	57
4.2 Descriptive Statistics for Africa .....	57
4.3 Correlation Matrix .....	59
4.4 Descriptive Statistics for the Blocks .....	61
4.5 Correlation Matrix for Blocks in Africa .....	64
4.5 Regression Results for Africa .....	69
4.5.1 Agency Costs Variables and the Interest Margin in Africa .....	69
4.5.2 Interest Rate Spread and Other Variables (Bank Specific, Macro Variables, Regulatory Variables and the Industry Specific) .....	72
4.5.3 Regression Results for the Blocks (North, Central and South Africa) .....	79
4.6 Conclusion.....	83
CHAPTER FIVE .....	85
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	85
5.1 Introduction.....	85
5.2 Summary .....	85
5.3 Conclusion.....	89
5.4 Recommendations.....	91
5.5 Further Research Directions .....	94
REFERENCES .....	95

APPENDIX.....105



**LISTS OF TABLES**

Table 3.1: indicates the summary of the various determinants of the IRS with their description and expected signs as well. ....52

Table 4.1: Summary statistics .....57

Table 4.2: Correlation matrix for Africa .....60

Table 4.3: Descriptive Statistics for North African Countries.....61

Table 4.4: Descriptive statistics for Central African Countries .....61

Table 4.5: Descriptive statistics results for South African Countries .....62

Table 4.6: Correlation Matrix for North African Countries.....65

Table 4.7: Correlation Matrix for Central African Countries .....66

Table 4.8: Correlation Matrix for South African Countries.....67

Table 4.9: Stability and Diagnostic Test .....68

Table 4.10: Regression results for Africa. The full table with the p-values is shown under appendix.....69

Table 4.11: Regression with only the agency variables .....71

Table 4.12: North African Countries Stability and Diagnostic Test Results .....78

Table 4.13: Central African Countries Stability and Diagnostic Test Results .....78

Table 4.14: South African Countries Stability and Diagnostic Test Results .....79

Table 4.15: Regression Results for North African countries. The full table with the p-values is shown under appendix. ....79

Table 4.16: The Regression Results for Central African countries. The full table with the p-values is shown under appendix. ....80

Table 4.17: Regression Results for South Africa Countries. The full table with the p-values is shown under appendix.....81

Table 5.1: Significance or otherwise of the variables with the spread 1 and spread2 .....89

**LIST OF FIGURES**

Figure 1.1: Africa's spread as compared to other Continents or Nations. .... 12

## LIST OF ACRONYMS/ABBREVIATIONS

ACTA	Agency Costs over Total Assets
AUDTA	Audit cost over Total Assets
BANKSPECI	Bank Specific
BCOMPP	Board Composition
BRES	Bank Reserves
CAR	Capital Adequacy Ratios
CEO	Chief Executive Officer
CPI	Consumer Price Index
DEMOLUM	Directors Emolument
EMOLUM	Emolument
ECCU	Eastern Caribbean Currency Union
EF	Efficiency
EMS	Emerging Economies
EXCH	Exchange Rate
F	Foreign Ownership
FGLS	Feasible Generalized Least Square
GLS	Generalized Least Square
GDP	Gross Domestic Product
D.O.F	Degree of Freedom
GMM	Generalized Method of Moment
HHI	Herfindahl-Hirschman Index
IMF	International Monetary Fund
INDUSPEC	Industry Specific
INFL	Inflation
INTVOL	Interest Rate Volatility
IRS	Interest Rate Spread
LICS	Low Income Countries

LM	Lagrangian Multiplier
LLP	Loan Loss Provision
MACROSPEC	Macroeconomic Specific Factors
MGT	Management Efficiency
NA	Not Available
NED	Non-Executive Directors
NIM	Net Interest Margin
OECD	Organization for Economic Co-operation and Development
PCSE	Panel Corrected Standard Errors
REG	Regulatory
RSKAVER	Risk-Aversion
RSQ	R-Squared
SD	Standard Deviation
SPREAD1	Net Interest Income Scaled Over Total Assets
SPREAD2	Advertised Average Bank Lending Rate minus Average Deposit Rate
SPRD	Spread
SSA	Sub-Saharan Africa
T.BILL	Treasury Bill Rate
VAR	Vector Autoregression
VIF	Variance Inflation Factor
US\$	United States Dollars
WDI	World Development Indicators

## ABSTRACT

Few empirical studies have been done on the bank interest rate spread in the context of Africa as a whole. However, these studies failed to explain the possible effects of agency costs on bank interest rate spread in Africa. This study, therefore, depending on bank level data on two hundred and ten (210) banks in twenty-eight countries in Africa, and controlling for macroeconomic variables, bank specific variables, regulatory as well as industry specific factors, we employed the fixed effects panel regression on the data in explaining the effects of agency costs on bank interest rate spread in Africa over the period 2006 to 2013. In trying to correct for serial correlation and heteroskedasticity we used the Prais-Winsten estimation technique which is robust to these problems. We employed two definitions for the dependent variable (spread 1-net interest income divided by total assets and spread 2-difference between the advertised universal bank average lending rate and the average deposit rate). Our results show that emolument (agency costs) feeds into the spread models suggesting that the higher the emoluments the higher the interest margin of banks in Africa. This is an indication that bank management charge higher margins since they can extract high rents in a form of high emoluments. This is a source of conflict of interest between the shareholders and the management. Secondly, our results show that the factors that were posited by Ho and Saunders (1981) are still relevant in the determination of bank interest spreads in Africa. Moreover, the findings suggest that determinants and significance of the bank net interest margin and spread can be different. Therefore, empirical models should be chosen with cautious for academic and policy studies. We recommend that bank regulators and board of directors must ensure that the level of emoluments (agency costs) are cut down to a reasonable limit that will not tend to influence high spread in Africa. This can be attained by holding on to efficient and more compatible incentive compensation packages. The results also show that central Africa contributes largely to Africa's high spread.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Agency theory deals with the relationship between owners (principals) and the agents (managers) of an organization. The agency problem arises as a result of the separation of ownership and management which indicates that the interests of shareholders and management are not in tandem. In theory, agents and for that matter bank executives are expected to handle the firm's resources under their watch in the best interest of the principals, but their actions are driven toward their own interest. Managers work towards achieving their interests in extracting rents from the organization at the expense of the owners due to the presence of the agent conflict (Berle & Means, 1932; Jensen & Meckling, 1976; Jensen, 1986; Fama, 1980). Since the owners are not always present with the managers they can be described as absentee landlords and usually gives the managers the room to operate in their own selfish interest. The consumption of corporate resources such as perquisites and bypassing profitable opportunities due to avoidance of risk by risk-averse managers in which the organization's owners (shareholders) would have liked to invest in are some evidence of self-interested managerial behaviour.

The agency problem from the banking perspective normally exists between the shareholders and management. Banks provide multiples of services to different customers at the same time, thereby making it difficult to prevent the agency problem in the banking sector. The agents are normally duress to choose between addressing their own interest or other interests competing interest of others. However, there is the need to enhance the corporate governance mechanisms in the banks to include the shareholders and depositors in the developing countries (Turner & Arun, 2003).

The classical principal-agent theory assumes that managers pursue different objectives and show different risk-taking attitudes than firms' owners. Managers hence, generally concerned about their job securities avoid risk-taking (Hirshleifer & Thakor, 1992). Apparently, they show more risk-averse taking behaviour than firms' owners, due to the fact that they are unable to nature their unemployment risk. On the other hand, dispersed shareholders behave risk neutral because they have larger incentives and are able to diversify their risk by having a number of portfolios (Jensen & Meckling 1976; Demsetz & Lehn, 1985).

The managerial issues discussed above come with a cost to the owners. This goes to explain that there is the possibility of reduction in the residual value accrued to these shareholders (owners). In trying to minimize or solve the agency problem, there is the need for the shareholders to monitor the works of the managers, thereby spending money through this monitoring (Mensah & Abor, 2014). The cost involved is termed the agency costs. Ross (1973) and Jensen and Meckling (1976) explain agency costs as the expenses that need to be incurred by the principals to encourage the managers to concentrate on shareholder wealth maximization instead of their own personal goals. Agency costs come in various forms or dimensions such as acts of corporate fraud or accounting mismanagement, the self-interest attitude on the part of managers focused on position or empire-building goals, non-profitable investment decision-making and the excessive rent extraction.

These costs can be put into three main forms: (1) the costs incurred to assess the managerial activities (for example fees paid to external auditors to audit the firm's financial position). Jensen and Meckling (1976) under pine that auditors are agents of the shareholders whose interests are considered different to those of the managers of the companies audited, (2) the

costs incurred in restructuring the organization in a way that will reduce the opportunistic behaviours of managers (for instance engaging external members to the board of directors or making modifications in the corporate components and administration order) and (3) opportunity costs incurred as a results of shareholders imposing limitations such as the necessities for shareholder votes on certain specific issues. This reduces the power of managers to take decisions to maximize shareholders wealth (Jensen & Meckling, 1976).

It is therefore prudent and crucial to resolve the managerial tendencies or problems. Evidence shows the internal governance can be used to reduce agency problems and its attendant costs. Easterbrook (1984), Jensen (1986) and Myers (1998), point out that the principal-agent problems between the corporate insiders and outside shareholders can be alleviated by the use of dividend policies. This theory indicates that managers will invest profits in unprofitable investments or been diverted for their personal benefits if profits is not paid to shareholders in a form of dividend. Jensen and Meckling (1976) argue that leverage is a good source of reducing agency costs associated with outside equity. Another way of reducing the agency costs is through the monitoring activities of institutional investors (ownership). Coffee (1991) studies the monitoring of the roles of the institutional owners and Shleifer and Vishny (1986) examined the roles of the large shareholders in an organization. Crutchley et al (1999) indicates that in many cases, corporate policy decisions are affected by the actions of institutional investors.

Instituting incentive compatible compensation packages has the chance of ensuring that managers (agents) work in the interest of shareholders (owners). For this plan to work to satisfy both parties, then the type and level of executive compensation is therefore important.

Executive compensation may take different forms such as salaries, pension benefits, perquisites and bonuses, and stock options. Kim and Nofsinger (2007) argue that designing incentive compatible solutions tend to align managers wealth to that of the shareholders so that both parties will have a common goal. However, executive compensation is not only as a good possible means of addressing the agency problem, but also contributes to the agency problem since managers can bargain for higher compensation through the use of power at their disposal (Bebchuk & Fried, 2003). Apparently, it is often possible for managers to extract rents (resources) from the shareholders when level of performance does not match the compensation level.

The ownership structure of a firm or an organization can help reduce the agency problems. For instance, the ownership structure of a bank can either enhance or minimize the agency problem. Managers will mostly make good decisions to maximize the wealth of the banks or the firm when they own a certain percentage of the shares of that institution. This implies that the wealth of the shareholders will also be maximized as well. Demsetz and Lehn (1985) and Jensen and Meckling (1986) argue that by managers owning shares of the firm, then the managers are more likely to share a common goal or interest with the shareholders (owners). This means that the level of agency costs can be reduced to a minimum level if managers hold a greater portion of shares in the firm.

On the other hand, other authors argue that managers holding larger portion of a firms shares is also likely to create agency costs. Demsetz (1983) and Fama & Jensen (1983), explained that managers having the greater ownership is likely to guarantee them enough voting control to make sure that they do not lose their position inside the company. A situation of this nature can lead to managerial entrenchment since the tendency to remove incompetent

and weak management is so tedious. This is so due to the fact that insider ownership can help alleviate agency problems while contributing to agency costs on the other hand especially in situations where management has appreciable votes.

Using foreign banks as an example, they usually have more resources, higher technology and talent compared to local banks. They are also more likely to be better managed since the local subsidiaries follow the corporate governance practices of their parent firms. Literature suggests that foreign banks usually make a selective selection for the most creditworthy customers. They therefore do not suffer from bad debts. Saka et al (2012), Unite and Sullivan (2002) explain that foreign bank entry comes with more improvements in the operating efficiencies. This indicates that the type of bank ownership is key to some extent in managerial issues. The type of ownership of banks can influence the management behaviour.

Another possible mechanism to reduce the agency problem is for the owners of the firm to appoint members to the governing board. This is a vital corporate governance mechanism that serves to alleviate the agency conflicts since the company's board determines the strategic direction of a company (Mensah & Abor, 2014). Fama and Jensen (1983) explained that one of the functions of the board of directors can serve as an information vehicle on which the investors in large organization could apply to check the dubious behaviour of the management. The board has the duty and the responsibility to decide the general strategic direction of the firm. Keenan (2002) argues that the board has the duty to ensure that satisfactory measures exist to safeguard the shareholder value. Therefore, it will not be out of place for shareholders to have a say in the strategic direction of the firm through the board

of directors. The independent non-executive directors can play vital roles to monitor the actions of managers of the firms since they are not related to the managers of these firms.

Recently, the strong relation between the stability of the banking system, economic growth and development of any country has been appreciated. It is thought of that the recent problems of most economies are as a result of weak financial systems in these economies. The authorities' in-charge of the economies all over the world, are these days alert to ensuring the safeness and the security of their financial systems to enable these sectors contribute their quota to the fiscal development of their respective countries. Folawewo and Tennant (2008) explained that in every economic development process, an effective financial intermediation is very paramount as they do effective mobilization of investible resources. Accordingly, the effectiveness of the banking sector plays a substantial part, in any economic growth and development.

The business of banking sector involves banks taking deposits and transforming these deposits into loans. Banks are the main source of credit and have a direct influence on the level of investment and expenditure in an economy. The differences between the incomes earn by banks on loans (assets) granted to customers and the expenses on deposits (liabilities) to depositors signifies a margin to them (Mensah et al, 2014). Actually, there exist two forms of measuring the spread: the ex-ante approach and the ex-post approach. The difference between the advertised average commercial banking lending rate and the advertised deposit rate (bank spread) is the ex-ante approach and the difference between the actual income earned on loans and expenses made on deposits is called the net interest margin, which is by the ex-post approach (Folawewo et al, 2008). This margin can be seen as a gauge of the effectiveness of the banking system (Demirguc-Kunt & Huizinga, 1999).

The high banking sector spread does not encourage savings and hence limits the funds for borrowers (Ndungu & Ngugi, 2000). This intermediation cost increase anytime there is an increase in bank inefficiency. Empirics show that higher spreads are as a result of high levels of concentration, thereby reducing competition (Demirgu-Kunt & Huizinga, 1999). Berger and Hannon (1989) suggested that higher profits could result due to higher concentration and not always as a result of higher lending rates since there could be a positive relation between efficiency and concentration. Quaden (2004), argues that the real economy benefits from a more efficient banking system since both the depositors and borrowers benefit simultaneously from financial surplus.

The spread differs widely across countries in the world, as well as between developing and developed countries and even between banks. Even in Africa, it varies across the blocks. The differences in the spread among nations across the world are as a result of the nature and competence of the financial sectors. The intermediation costs in weak financial sectors are higher than those of the strongest financial sectors. For instance, studies indicate that the spread in Africa, Latin America and the Caribbean countries are higher than that of the OECD countries (Randall, 1998; Brock & Rojas-Suarez, 2000; Chirwa & Mlachila, 2004; Gelos, 2006; Crowley, 2007). La Porta et al (1997) explained that as a result of the differences in the development of markets and institutions, rights and protection of creditors, there exists the difference in the net interest margin between developing and developed countries.

The pure spread is influenced by four main factors namely: the market structure, the average size of the bank's operation, the level of the bank's risk aversion and the uncertainty in the money market interest rates on the loans and deposits (Ho & Saunders, 1981). Furthermore,

other authors have extended the Ho and Saunders model by introducing different factors considered to be possible determinants of the bank interest rate spread. As indicated in Mensah et al, (2014), these factors include a number of bank specific factors (such as credit risk, bank size, average operating costs and bank management inefficiency), industry factors (market structure), regulatory factors (capital adequacy ratio and banks' reserve requirements) and macroeconomic factors (such as inflation, volatility of interest rates and exchange rates) (Mensah et al, 2014; Aboagye *et al*, 2008; Angbazo, 1997; Maudos & Fernandez de Guevara, 2004; Carbo Val Verde & Rodriguez Fernandez, 2007; Saunders & Schumacher, 2000; Brock & Rojas-Suarez, 2000; Martinez & Mody, 2004; Gelos, 2009, Bawumia *et al* ,2005; Fungáčová & Poghosyan, 2009; Poghosyan,2012).

In determining the prices to be charged by players in an industry then the role of the nature of the market structure of that industry is paramount. With many players in the industry (competitive market) the players cannot have the power to charge excessively. On the other hand, with few players in the market (concentrated market) there is opportunity for the players to charge excessively (monopolistic prices). Indicators used in literature in measuring the market structure in the banking industry include the Lerner index, the five largest bank concentration ratio, Herfindahl index and the three largest bank concentration ratio. Martinez (2004), Aboagye et al (2008), Amidu and Wolfe (2012) found that the Lerner index (proxying market power) recorded a positive relation with the bank interest rate spread in both the developed and the developing countries. However, Hesse (2007) finds opposite results. In the case of developed economies, Maudos and Fernandez (2004), Angbazo (1997), Saunders and Schumacher (2000) and Maudos and Solis (2009) have shown that the proxies for market structure have significant and positive relation with the interest rate spread.

In relation to the bank-specific risk, the risky banks compensate for their risky levels by charging higher margins. Poghosyan (2012), Maudos and Fernandez (2004), Angbazo (1997), Maudos and Solis (2009), Mensah et al (2013) and Claessens et al (2001) find larger margins have positive relations with the credit risk as banks need to compensate for the level of risks. Hesse (2007), however, finds negative, but significant relation between the bank interest rate spread and credit risks. Less efficient banks experience higher costs to income ratio. These banks are more likely to pass on their inefficiency to their customers in a form of higher margins (Agbloyora, Abor, Adjasi, & Yawson 2013). Poghosyan (2012), Demirgu-Kunt, and Huizinga (1999), Martinez Mody (2004), Maudos and Fernandez (2004), Williams (2007) and Maudos and Solis (2009) found that banks that are less efficient normally work with higher costs and hence, charge higher margins.

The theoretical model posited that the bank risk aversion impact the interest rate spreads. Empirics such as Mensah et al (2014), Saunders and Schumacher (2000), Maudos and Guevara (2004), Aboagye et al. (2008), Williams (2007), Maudos and Solis (2009), Amidu and Wolfe (2012) and Angbazo (1997) used the capital adequacy ratio (capital to assets) as a proxy the level of bank risk aversion. These studies found out that the capital adequacy ratio positively and significantly impacted the bank interest margin as predicted by the theoretical model.

Ho and Saunders (1981) suggested that the bank interest rate spread is affected by the amount of reserves that banks by law are supposed to maintain. Thus, there exists in all over the world what we called the fractional banking system. This means that banks have to 'reserve' a fraction or percentage of all deposits received. Banks therefore cannot give out all the deposits that they receive as loans. Banks are required by Central banks to maintain

such reserves to promote the liquidity of the banks and to promote financial stability. Ho and Saunders (1981), Maudos and Guevara (2004), Bawumia *et al* (2005) and Mensah *et al* (2014), found positive relationship between reserve requirements and bank interest spreads. However, Aboagye *et al* (2008), findings indicate that bank interest margin decreases with an increase in the reserves of banks.

The dealer's model suggests that macro environment variables also affect bank interest rate spread. In relation to the macroeconomic control, banks take inflation into consideration when valuing their loans. It suggests that, there should be a positive relationship between the interest rate volatility in the money market and the bank interest rate spread. Maudos and Fernandez de Guevara (2004) and Mensah *et al* (2014) findings indicate that the bank interest rate spread is positively related to the volatility of interest rate. The upwards changes in inflation impact the spread positively. This means that banks take into consideration the level of inflation when setting their lending rates. The deposit rates are usually less sensitive to changes in inflation as compared to the lending rates (Mensah *et al*, 2014). Aboagye *et al* (2008), Beck and Hesse (2009), Mensah *et al* (2014) and Bawumia *et al* (2005), Chirwa and Mlachila (2004) found a positive and significant relation between the bank interest rate spread and inflation. This suggests that the possibility of low levels of inflation translating into lower spreads is high. However, a negative relation between this variable and the spread was recorded in the English Speaking West African Countries by Crowley (2007). His explanation is that, since banks get and invest funds through the money markets then, the money market interest rates obviously affect the bank interest rate spread.

In view of the above discussions, we strongly believe that banks with strong corporate governance mechanisms in place will have a lower spread (since managers cannot extract

excessive rents associated with higher spread) as compared to those banks with weak institutional structures. This study therefore extends the previous works by considering agency costs as possible factors that contribute to the high bank interest rate spreads and we also expect that macroeconomic, bank-specific, industry-specific and regulatory factors affect bank interest spreads.

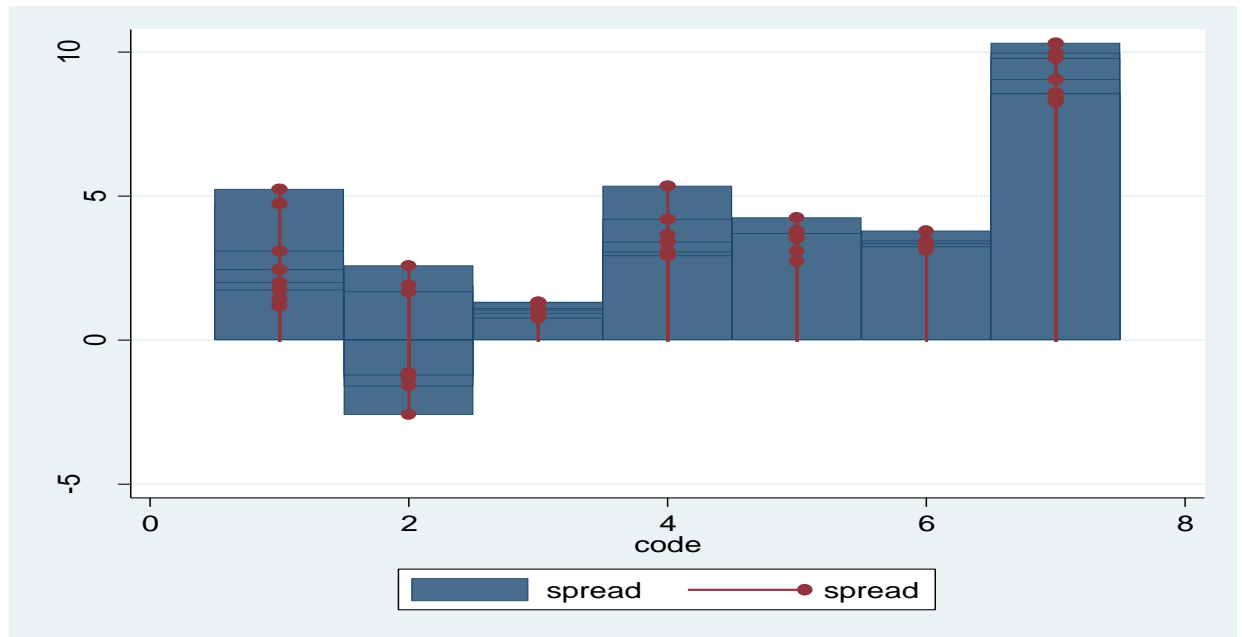
## **1.2 Problem Statement**

Although bank interest rate spread has been studied widely in relation to the determinants and effects on the economies likewise agency theory on corporations, literature has not placed a lot of emphasis on the banking sector in Africa. Previous empirical studies could not give responses to the nature of the interest rate spreads in Africa (Mensah et al, 2014). These studies merely looked at the issue by including bank-specific financial factors, such as non-performing loans, bank size, operating expenses, collateral, capital, liquid assets and loan quality as determinants of the bank interest rate spreads. What literature has not provided is if there is any possible explanation for agency costs effects in relation to the bank interest rate spreads in Africa. Interestingly, to our best of knowledge, except a study done in Ghana by Mensah and Abor (2014), no study has been done in relation to the effects of agency theory/costs on bank interest rate spread in Africa in general.

The banking sectors in most developing countries, especially Africa are still grappling with consistently high spreads despite the extensive application of costly financial sector reforms. The findings of Randall (1998), Gelbard and Levite (1999) and Brock and Rojas-Suarez (2000) all proved that interest rate spreads in Sub-Saharan Africa, Latin America and the Caribbean are wider than in OECD countries (cited in Poghosyan, 2010). African countries continue to experience high spread (Crowley, 2007; Folawowe et al, 2008). Figure 1.1

indicates that Africa’s spread is really high as compared to other continents or nations. The figures show that Africa’s spreads over the study period are all above the world’s average spread.

**Figure 1.1: Africa’s spread as compared to other Continents or Nations.**



Code1-USA	CODE2-UK	CODE3-JAPAN	CODE4-AUSTRALIA
CODE5-ITALY	CODE6-ISREAL	CODE7-AFRICA	

Source: WDI 2014 and Own computation

Claus and Grimes (2003) explained that, there is generally well organized financial systems in the developed countries which enhances the easy flow of loanable funds from lenders to borrowers, but less developed financial systems exist in the developing countries. As a result, the spread in the developing countries is always high. These high spreads are as a result of volatile lending rates and low deposit rates, high operating costs, high concentrated banking systems, financial taxation and high levels of credit risks. The impact of higher

banking spreads could affect small and medium enterprises badly. Thus, it will be difficult for new setups thereby increasing the decline of economic growth in Africa. Sustained high spreads is indication of inefficiencies in the financial systems. So the question is, must Africa continue to experience this high spread? If no, then what can be done to alleviate this problem? The agency problem has brought about the collapse of many corporations and banks. For instance, Meridian BIAO, Cooperative bank and bank for housing and construction, all in Ghana and several others in other countries in Africa.

Weak governance systems were seen exhibiting in a form of excessive risks taking, disregard for rules of prudent lending, over showing of power play and insider abuses and fraudulent practices in the banking systems. Ideally, the relevant institutions are expected to make prudent borrowings and lending decisions but this is not always the case. For instance, some banks failed in checking the credit worthiness of potential borrowers because these borrowers are affiliated to some key politicians. This indicates that the managers failed to work in the interest of the shareholders at this point. Managers or agents may tend to over emphasize organizational survival to protect their job security. In fact, these issues do not only pertain to local financial institutions, but exist in foreign financial institutions as well.

The capacity of the stakeholders to check the behaviour and decisions of managers is limited by increases in asymmetry information due to the complexity of the banking system (Andres & Valerde, 2008). As a result of asymmetry information banks sometimes give inaccurate, incomplete reports to the public and the regulatory authorities. This gives rise to hidden information from the principals and inflation of profits through the creative of accounting systems (Ranti, 2011). Instances where managers take fact compensation, salaries and the like which is not in the interest of the shareholders breeds the agency problems. Therefore,

the managers will pass this problem to potential borrowers by charging higher rates. It is in the light of the above problems, that this research work studied the effects of agency costs on bank interest rate spreads in Africa. This study therefore tries to fill this gap and with the opinion of motivating argument on measures that will cause a reduction in the interest rate spreads in Africa.

### **1.3 Objectives of the study**

Generally, this work aimed at explaining the relation between agency costs and bank spread in Africa. However, we set for ourselves the following specific objective to achieve:

1. To explain the effects of agency cost variables (executive compensation, bank ownership structure and board composition) on bank interest rate spreads in Africa.
2. To re- examine and determine whether the effects of macro, regulatory, bank specific and market power determinants of bank interest rate spreads (spread1 and spread2) are affected equally in Africa.
3. To estimate the differences in the bank interest spread among the blocks (north, south and central African countries) to help estimate their contribution to the spread in Africa.

### **1.4 Research Questions**

This study, therefore aimed at answering the following questions:

1. What are the effects of the agency costs on bank interest rate spreads in Africa?
2. To what extent does the macro, regulatory, bank specific and market power determinants or factors affect bank interest rate spreads (spread1 and spread2) in Africa?
3. To what extent does bank interest rates spread differ among the blocks (north, central and South African countries) in Africa?

## **1.5 Hypotheses**

In order to have the appropriate answers to the research questions and to achieve the objectives of this study, we test the following null hypotheses.

### Hypothesis 1

Ho: there is no statistical relationship between the agency costs variables and bank interest rate spread in Africa.

### Hypothesis 2

Ho: there is no statistical relation between macroeconomic, regulatory, bank specific determinants or factors and bank interest rate spreads (spread1 and spread2).

### Hypothesis 3

Ho: there is no statistical significance difference in the bank interest rate spread among the blocks (north, central and South African countries) in Africa.

## **1.6 Methodology**

In examining the possible effects of agency theory/costs variables on the bank interest rate spread in Africa and by controlling for macroeconomic, regulatory and institutional fundamentals, we invoke an econometric model on annual bank level data set where the interest rate spread is endogenous and thus depends on a lot of factors such as, industry specific (concentration/competition), bank-specific variables and others. Two models were developed – model one for spread 1 (net interest income divided by total asset) estimation and model two for spread 2 (the average lending rate minus the average deposit rate) estimation. We follow the works of Aboagye et al (2008), Ho and Saunders (1981), Angbazo, (1997), Maudos and Fernandez de Guevara (2004), Mensah and Abor (2014),

Fungáčová and Poghosyan (2009) and Poghosyan (2012). A balanced panel estimation (fixed-effects) method was applied to the data by using the Prais-Winsten estimation technique. In order to alleviate the problem of heteroskedasticity, the study made use of the Panel Corrected Standard Errors (PCSE) model of the Generalized Least Squares (GLS) which is robust to heteroscedasticity and autocorrelation.

### **1.7 Significance of the Research**

The study can be useful on multifaceted grounds. It contributes to literature in that there has not been any significant studies on agency theory in relation to bank spread in Africa. Secondly, studies on the bank spread have not been done on the whole Africa. It will help to enrich the knowledge of students and future researchers who will work on a related topic. Conducting such research will help reveal the impact of agency theory/costs on bank spread and the impact on the performance of banks in Africa. The study will also provide comprehensive recommendations to policy makers in the banking, non-banking and other institutions on the effects of agency costs/theory on bank spreads and ways to alleviate the effects of the high bank spread on operations of organizations in Africa.

### **1.8 Research Scope and Limitation**

The research could be limited in terms of incomplete data, could not permit the involvement of other equally important factors to fully address the research questions since it is concerned with Africa: this would be due to some missing data within the period under consideration. The selection of the countries is based on the availability of the data from the year 2006 to 2013. It might not be possible to include all countries in Africa for this study, especially in cases where there are no available data. In this vein, the study focused on the effects of agency variables such as emolument, bank ownership structure, and board

governance and other determinants such as inflation, exchange rate, Treasury bill rate, loan loss provisioning, reserve requirement, bank size, bank efficiency, capital adequacy ratio and volatility of interest rates on bank interest rate spread. Despite the limitations, the research objectives were achieved through a comprehensive approach used.

## **1.9 Chapter Outline**

Chapter one presents a proposal on the selected topic in relation to what and how the study will be done. Chapter 2 reviews the literatures on the theories of and empirical studies on agency theory/costs in relation to bank spread as well as providing stylized facts on the agency theory/costs on bank spread in Africa. Chapter 3 presents the methodology we employed for this study. Chapter 4 presents the empirical results and in chapter five we conclude the study as well as offering some recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents the theoretical literature and the empirical literature of earlier studies on bank interest rate in Africa. Under the theoretical literature study, we will discuss the agency theory/agency costs and ways of reducing it, the explanatory variables for the valuation of the bank interest rate spread, the theories and the theoretical model of interest rate spread and its extensions. The empirical literature covers the earlier works and variables that were adopted in the studies of the bank interest rate spread.

#### **2.2 Agency Theory and the Agency Problem/Costs**

Jensen and Meckling (1976, p. 308) explained the agency relationship in terms of “a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some services on their behalf which involves delegating some decision-making authority to the agent” (cited in Ranti, 2011). Separating ownership from control is likely to give rise to agency problems or the principal- agent problem which indicates that shareholders' interests are not aligned with those of management (Berle & Means, 1932; Jensen et al, 1976; Jensen, 1986; Fama, 1980). Jensen and Meckling (1976) assumption is that because agents do not own firms' resources, they might carry out moral hazards in order to augment their wealth at the expense of the principals. There are, however, influential voices that consider this view to be quite naive (Easterbrook & Fischel, 1991). According to this perspective, there are different market mechanisms that work simultaneously as an invisible hand and correct the interests of investors and officers by creating governance provisions that are optimal for society (Easterbrook et al, 1991). Thus, theory submits that, separating ownership from management increases the opportunity for the management to

take action for their own benefit, and at the expense of shareholders and stakeholders. This situation is referred to as the principal-agent problem.

Eisenhardt (1989 p. 58) elucidates that the principal-agent problem (agency conflict) comes when “(a) the desires or goals of the principal and agent conflicts and (b) it is difficult or expensive for the principal to verify what the agent is actually doing” (cited in Ranti, 2011). The two main sources of agency conflicts are: asymmetric information (when agent’s actions cannot be adequately supervised by the principal) or uneven incentives between the principal and agent (due to the impossibility of having perfect aligned interests between principal and agents) and may affect the outputs of the agent (Alexander, 2006). Fama and Jensen (1983) argue that the agency conflict occurs mostly when significant decision made by agents is not affected substantially by the shareholders.

Ross (1973) defines the agency relationship as a relationship between two parties when one selected as an agent act for and on behalf of another, the principal, in a particular area of decision problems. The author assumes that agency problem was of conditions of uncertainty when both the agent and principal are utility maximizers. The agent is also considered to have more insight (better information) about the state of the world than the principal. The author concludes that an optimal solution to the principal agent problem can only be achieved if there is perfect information channel between the manager and the owner with regards to the exact remuneration for the agent that will bring into line with the interests of both parties.

The costs involved in resolving these problems are called the agency costs. Agency costs can be in three main forms: (1) costs to check the managerial actions, such as audit fees

(the size of the fees charge rest on a number of factors such as the type of the auditing firm, the size of the audit firm and so on). Jensen and Meckling (1976) stated that auditors are agents of the shareholders whose interests are considered different to those of the managers of the companies audited. (2) The costs incurred in restructuring the organization in a way that will reduce the opportunistic behaviour of and (3) opportunity costs incurred as a result of shareholders imposing limitations such as the necessities for shareholder votes on certain specific issues. This reduces the power of managers to take decisions on shareholder wealth (Jensen et al, 1976).

### **2.3 Ways of Mitigating the Agency Problems**

Literature suggests that there are various ways that the issues of the agency problem can be addressed or alleviated. These include: executive compensation, board composition and ownership structure of the organization.

#### **2.3.1 Executive Compensation**

Directors of corporate organizations receive yearly salaries or compensation for the services (including meetings they attended) they rendered to the organization over the period. The overall amount of directorship fees differs from company to company. Executive compensation may take different forms such as salaries, pension benefits, perquisites and bonuses, retirement benefits and stock options. These incentive package solutions have a tendency to put the agents' goals to that of the principals so that both management and owners have goals aligned (Mensah et al, 2014; Kim & Nofsinger, 2007; Murphy, 2012).

However, Bebchuk and Fried (2003) argue that executive compensation does not only address the agency problem but it also contributes to the problem. They argue that boards

of publicly traded companies with dispersed ownership are not able to overpower the bargaining power of the managers at length. Thus, managers can use their power to negotiate for high compensations that are in their favour. Apparently, it is imperative that the owners through the board of directors ensure that the right levels of compensation are applied.

### **2.3.2 Board of Directors/Board Composition**

The shareholders elect members to the board for a multiple-year terms. The board members (made of non-executives and executive directors) are men and women who are experienced in the world of business ([http://www.investopedia.com/terms/bd/boardof\\_directors.asp](http://www.investopedia.com/terms/bd/boardof_directors.asp)). Andres et al (2008) explained that the size of the board has to be a mixture of knowledge and resources, and effective communication and coordination that characterizes the boards. The key duty of the board of directors is to safeguard the resources of the shareholders and receive attractive returns on their investments. Other responsibilities of the board include: setting the planned course of the bank and supervising the risk management strategies of the bank (Tsorhe, Aboagye, & Kyereboah-Coleman, 2011), select, evaluate and approve suitable compensation for management, evaluate the attractiveness and pay dividends, approves bank's consolidated financial statements, establishment of audit, risk management, credit management and compensation committees and importantly determines the strategic direction of the organization.

John and Senbet (1998) explained that agents are being monitored by the board of directors through communication and reporting as well as through reviews and audit of the implementation of codes and policies. Fama and Jensen (1983) indicated that, the duty of the board is seen as an information structure that shareholders in large organization could use to check the individual behaviour of management. It is difficult to have a complete board

change take place due to hostile takeovers because most organizations of which banks are no exception operate on a rotating system. That is to say, that only part of the directors is up for elections each year.

### **2.3.3 Ownership Structure (Foreign or Local/Public)**

The ownership structure of an organization in this case bank's ownership structure is broadly recognized in the literature of finance and economics as an influential factor of the firm and for that matter banks performance (Fungacova & Poghosyan, 2009). The ownership of banks is mainly of two types. Namely state (or publicly) owned and privately (or foreign) owned banks (Cornett, Khaksari, & Tehranian, 2010; Fungacova et al, 2009). A bank is considered to be State (publicly) owned banks, if a majority of the bank's assets is held by the state (public). When foreigners hold majority of a bank's total assets, the bank is considered as a foreign bank. When incentives to develop and to hold expenses are strong, as well as governmental assistance and exploitation are considered, then private (foreign) ownership is preferred (Cornett et al, 2010). It is not in every situation that the private ownership will be optimal. Cornett et al (2010) explained, that when the issue of monopoly power, externalities or distributional issues are considered, then the private ownership is likely to be a disservice to the parties it serves. However, the theoretical model did not consider the ownership structure of the bank as possible determinant of the spread.

### **2.4 Bank Interest Rate Spread**

The net interest income to the total assets ratio is termed the interest margin (Chowdhury & Ahmad, 2012; Demirguc-Kunt et al, 1998). This margin is also called the banker's mark-up (Ohlson, 1980). Folawewo et al (2008) defined interest rate spread as the difference between the average commercial lending rate and the deposit rate. The spread becomes high if the

lending rate is far higher than the deposit rate. Rose and Hudgins (2008) explain that the spread measures the efficiency of a financial firm's intermediation function and the strength of competition in the firm's market. Ho and Saunders (1981) explained that, the 'pure' spread is different from the actual spread in that, the pure spread is based on the micro level which is impacted by the level of bank management risk aversion, the extent of bank's operations, the elasticity of the interest rate and the variations in the interest rates.

## **2.5 Theories of Interest Rate Spread**

### **2.5.1 Keynesian Liquidity Preference Theory**

The interest rate spread is determined using the principles of the demand and supply theory (Quarmye, Owusu Kwaning & Ababio, 2014). It underscores the point that the interest rate is solely monetary in nature as different from the actual theory of the classics. This theory takes the supply of money during the short run and base on the demand for money or the liquidity preference to determine its interest rate. The significance of this theory to the study is that due to the liquidity preference bank should always minimize nonperforming loans because by doing so would reduce the risk of the bank. This can be done through reduction of interest rate spread.

### **2.5.2 Adverse Selection Theory**

According to this theory, information sharing increases the pool of borrowers, reduces the defaults, increases lending and reduces interest rates (Pagano & Jappelli, 1993). When banks become monopolistic in some instances, lending decreases due to information transfer thereby increasing the likelihood of price discrimination between safe and unsafe borrowers. This seems to suggest that granting more credit to the credit worthy borrowers does not completely compensate for granting little credit to the risky borrowers. This model further

implies that information sharing should reduce default rates. The significance of this theory to the study is that one of the reasons for higher interest rate spread is the information irregularity that occurs between the borrower and the lender. Adverse selection is a situation where the bank advances credit to economic agents who are not necessarily credit worthy.

## **2.6 The Determinants of Interest Rate Spread**

### **2.6.1 Macroeconomic Variables/ Environment**

The interest rate spread is affected by the macroeconomic environment as it influences the ability to pay borrowed loans. Investors are more likely to record less returns as a result of increase in nonperforming loan (which decreases profits) due to poor economic growth and this probably, leads to banks charging higher margins.

#### **2.6.1a Inflation**

Inflation can be defined as a persistent increase in the prices of goods and services over a period of time (Quarmye, Owusu Kwaning & Ababio, 2014). It is normally expressed as an annual percentage rate of change. Increase in inflation leads to a reduction in the purchasing power of one's money. When there is an increase in the money supply more than the economic growth that serves as the primary cause of inflation. Inflation affects economy growth through its impact on the role of financial intermediaries in an economy. Higher inflation has the tendency to decrease the returns on assets and this situation does not encourage savings but encourages borrowing. Economies with higher inflation rates normally experience higher interest spread.

### **2.6.1b Treasury Bills (T-bills)**

Treasury bills are short-term securities that are issued by the government with maturity ranges from three months to one year (Deloitte, 2013). Their prices are always less than the par value but the holder will receive the full par value from the government. Banks largely depend on the Treasury bill rate to set their lending rates and governments also use it as the indicator of its interest rate policy (see Mensah et al, 2014). High T-bill rate indicates high lending rate and for that matter high bank interest rate spread while low T-bill rates are likely to give rise to low lending rates (Ngugi, 2001).

### **2.6.1c Interest Rate**

It is the sum of interest paid over a period of time stated as a percentage in relation to the amount loaned out. Lender charges interest as a form of compensation for the loss of the assets used. That is to say the lenders could have used the money for other things that might have given them some income. Borrowers considered high risk are usually charged higher rates and lower risk borrowers receive a low rate of interest. Pandey (1999) explained that the real interest rate is always adjusted for inflation (nominal minus inflation rate) while the nominal does not adjust for inflation. Banks are exposed to interest rate risk as a result of adverse movement in the interest rates due to assets and liabilities repricing at different times. Bank interest rate spread increases with an upward movement in the interest rate risks of banks.

### **2.6.2 Bank Specific Variables**

The banking sector interest rate spread depends also on some characteristics of the banks. Ho and Saunders (1981) indicated that, the spread depends on the level of bank management, risk aversion and the average size of bank transactions (cited in Vins & Bloch,

2008). Maudos and Fernandez (2004) argued that operating expenses affect bank interest rate spread. Default risk is also a bank specific factor that affects the interest spread (Angbazo, 1997).

### **2.6.2a Bank credit risk**

As a consequence of doubt in the markets, information irregularity and policy environment, banks are exposed to several patterns of risks such as credit risk and foreign exchange risk. The bankruptcy of the customer to return the loan taken from the bank and this cuts the earnings of the bank is refer to as Credit risk. To compensate for credit risk, depository financial institutions charge a premium for the loans they pay away to clients. The amount of the premium depends on the type of customer, the amount of a loan and size of collateral if any. The higher this premium, the larger the interest rate on loan and this likely reduces the demand for loans. The Banks make some provisions for loan loss in their books as they advance credit to customers. A bank becomes more risky as the provision becomes high in relation to the total credit given to customers (Saka et al, 2011).

### **2.6.2b Bank Size**

Bank size is measured as the logarithm of total assets (Hyung-Kwon Joeng, 2009; Chernykh & Theodossiou, 2011). Bank size measures the possible or potential of economies or diseconomies of scale to be experienced in the banking sector. Banks are less profitable and exhibit smaller margins in countries where banking assets contributes largely to the GDP especially in a more competitive banking sector (Demirguc-Kunt & Huizinga, 1998). That is, the larger banks will charge a lower margin should they enjoy economies of scale.

### **2.6.2c Quality of Management/Bank Management Efficiency**

It is believed that less cost to income ratio is an indication of good management skills and results in lower interest margin. Angbazo (1997) indicated that for bank management to be described as good then they should be able to operate with low costs thereby, choosing very lucrative assets and low-cost liabilities. According to Maudos et al (2004) the quality or efficiency of management as proxy by the cost to income ratio is defined as the operating cost necessary to generate one unit of gross income. Demirguc-Kunt and Huizinga (1999) maintains that variations in the bank interest margins are as a result of the difference in the operating costs and the overhead costs. Banks then pass these operating costs to the depositors and borrowers.

### **2.6.3 Market Structure**

The bank interest spread is affected by the type of market the banks operate in. Theory suggests that in a competitive market environment, the spreads between the lending and deposit rates are generally low since there is efficiency in the intermediation as a results of competitive pricing (Grenade, 2007). Ho and Saunders (1981) explained that in the non-competitive markets the size of the spread is usually much higher. The structure of the market can be measured by competition-using the Lerner index (LI) or by concentration by using the Herfindahl Hirsch Index (HHI). The value of the index ranges from 0 (perfect competition) to 1 (monopoly). Lower competition indicates higher margins.

### **2.6.4 Regulatory Factors**

#### **2.6.4a Reserve Requirement**

The monetary Council or the central banks by law ensures that the universal banks keep certain percentage of their deposits or other liabilities (Grenade, 2007). This requirement

comes with no interest and reduces the loanable funds for the banks. Banks therefore, charge higher margin to compensate for this reserves that are held with the central banks (Maudos & Fernandez, 2004). Though, these reserves are used by the central banks to safeguard the soundness of the banking system, however, it reduces the revenue of banks which is a cost to these banks (Grenade, 2007). This means that banks can pass these costs to their customers in two ways: (1) by giving the depositors lower deposit rates, and (2) by charging the borrowers higher lending rates. This situation will widen the spread between the two rates.

#### **2.6.4b Management Risk Aversion (The Degree of Risk Aversion)**

Risk adverse investors will invest in securities that have less level of risk. The investors interested in 'safer' investments will generally go for government bonds which usually give lower returns. Maudos et al (2004) explained that the risk aversion, which is expressed by the coefficient of absolute risk aversion,  $-U''(W)/U'(W)$ , where it is assumed that the bank is risk averse,  $U''(W) < 0$ , the former expression is greater than zero. Obviously, the more risk-averse banks will exhibit higher margins. This ratio is used to protect depositors and promote the stability and efficiency of financial systems around the world. Standard finance theory suggests that equity is more expensive compared to debt. This suggests that banks with more equity in their capital structure are more likely to reward themselves by exhibiting higher margins for the high level of equity they keep.

#### **2.7 Empirical Studies on Agency Theory/Costs**

Literature suggests that since there is a separation of ownership, there is the tendency of mismatch of interests of the owners and the agents. Below are some of the empirical studies.

Mercado-Mendez and Willey (1995) studied the agency theory in the banking industry by using a sample of the 104 largest banks in the U.S over the period 1985-1989. The authors used earnings volatility, managers' portfolio diversification losses, bank size and standard deviation of the bank equity returns on three financial policy variables of managerial stock ownership, leverage and dividend yield to proxy for agency costs. The findings indicate that the bank's level of managerial stock ownership, leverage and dividend are impacted by bank size and a degree of the managers' portfolio diversification losses.

Examining the link between board composition and corporate performance, Lawrence and Stapledo (1999) examined whether there is a positive relation between independent directors of the board of directors and executive compensation in Nigeria. The study employed a sample of 700 directors selected from the Australian Security Exchange (ASX) listed companies in 1995 operating in Nigeria. The findings suggest that non-executive directors (NED) do not influence the chief executive officer (CEO) remuneration over that period and there is no statistical significant relation between the NED to total board ratio and adjusted shareholder returns.

According to Jensen et al. (1985) there are three main problems at the management level that can generate conflict of interest. First is the choice of effort, the differential risk exposure and lastly differential time horizon. Thus, the incentives for moral hazard and information asymmetry are increased. Moral hazard refers to the agents' actions once is in a contractual relation. Information asymmetry creates incentives for hidden actions of the agent. Consequently, it can appear as moral hazard from the situation where the principal does not know whether the agent is acting according to its interests. The agency theory addresses these problems through incentives and supervision. The supervision mechanism

is characterized by ex post control and enters into the attributions of the board circumstances the composition of the board (size, expertise, and independence) becomes a crucial element of effective corporate governance.

Many authors have verified whether the choice of financial decisions such as leverage, dividends and insider ownership help reducing the agency conflicts within an organization (Crutchley, Marlin & Jensen, 1999). The writers tested one financial decision at a time, so as to get the insights right. For instance, Rozeff (1982) observed that the agency problems are decreased in firms that pay dividend. Dempsey and Laber (1992) confirmed this assertion in their study that used later periods altering for industry changes and testing with factor analysis.

Friend and Lang (1988) found that the agency problem or agency costs is possibly reduced by the leverage decisions that aim at increasing debt financing. Demsetz and Lehn (1985) concluded that agency problems are offset through ownership concentration, whereas Crutchley and Hansen (1989) noted that the agency problems may be reduced through greater insider ownership. Easterbrook (1984) opinions that supervision by investment bankers, media and auditors who serve as mediators can help reduce the agency problems. This kind of supervision occurs with external financing. Paying of dividend removes excess cash flows and influences the decision to rely on external capital, which subject the firm to capital market examination.

Denis (2007) studied the dividend policy in United States (U.S), Germany, Japan, France and the United Kingdom (U.K) by using different firms over the period 1994-2002. His result indicates that the larger firms, more profitable firms and those firms whose equity

contains a large fraction of retained earnings have the tendency or the ability to pay dividends. However, there is variation in the relationship that exists between the dividend payout policy and the growth potentials. In sum, these results cast hesitation on catering explanations for dividends, signaling and clientele, but support the theories on agency cost-based lifecycle. On the other hand, Brave et al (2005) finds contrary results from his study on 384 financial executives. The study employed additional 23 members in determining the factors that determine the share repurchase and dividend decisions. The result indicates that management opinions offer slight provision that dividend payout policy is used for agency costs viewpoints.

## **2.8 Empirical Studies on Interest Rate Spread/Net Interest Margin**

There are extant studies on investigating the determinants of interest rate spread and net margin banks. Each study in its own unique way tries to analyze the effects of these factors on the spread and the effects of large spread on financial intermediation in the various economies. Studies done in Africa on the interest spread include: Aboagye et al (2008), Folawewo et al (2008), Beck and Hesse (2006), and Ndungu and Ngugi (2000), Crowley (2007), Mensah et al (2014).

Aboagye, et al (2008) explained how the bank net interest margin responds to variations in the bank-specific, macroeconomic and banking industry specific factors in the Ghanaian banking sectors using 17 banks over the period 2001-2006. The study uses fixed effect generalized least squares panel regression. The authors decomposed the operating costs into staff costs, occupancy and depreciation and administrative and other costs. Their results show that the banks' net interest margin in Ghana increases with an increase in the staff costs, inflation, bank market power (or concentration), administrative costs, bank size, and

the level of bank risk aversion. However, the net interest margin decreases with an increase in management efficiency, excess banks reserves and the lending rate of the central bank. The authors concluded that in order to reduce the interest margin, then inflation must be managed so as to remain downwards, banks should not be encouraged to expand too much and central bank should reduce the capital adequacy ratios.

Beck and Hesse (2009) examines the factors that contribute to the Ugandan banking system constantly high margins and spreads by using bank-level dataset over the period 1999-2005. The findings suggest that foreign banks exhibit lower interest rate spreads, but there exists no robust and economically significant relation between foreign bank entry, privatization, market structure, banking efficiency and bank spread. Moreover, the variations in the bank spreads due to over-time could slightly be explained by the macroeconomic factors. However, the variation in spreads and margins was largely explained by the time-invariant bank-level fixed effects. Also, finding suggests that banks exhibit higher margins as a result of incurring higher costs when they operate in the low end of the market. In conclusion, the authors were of the view that, bank size, institutional weaknesses and high Treasury bill rates contributed largely to the observed high interest margins in the Ugandan banking sector.

Folawewo and Tennant (2008) examined the factors that determine the interest rate spread of 33 Sub-Saharan African (SSA) countries over the period 1988-2005. The study focused on macroeconomic variables by using dynamic panel data model. The variables employed includes: inflation, exchange rate volatility, the discount rate, the rate of government deficits to GDP and Treasury bill rate. The findings indicate that the following factors: discount rate population size, public sector deficits, reserve requirement, level of money supply, the

extent of the crowding out effect of government borrowing, inflation and the level of economic development influence the Sub-Saharan Africa's interest rate spread.

Considering the period 1995-2010, Nampewo (2013) employed time series data to examine the factors that determine the interest rate spread in the Ugandan banking sector. The author employs the Granger two-step and the Engle technique to test for co-integration among the ratio of bank rate, money supply of gross domestic product (M2/GDP), Treasury bill rate, the proportion of nonperforming loans to total private sector credit and exchange rate volatilities. The result indicates that an increase in the following variables: non-performing, the bank rate and the treasury bill rates leads to an increase in the bank interest rate spread in Uganda. On the contrary, the Ugandan banking sector interest spread decreases with an increase in the real GDP and M2/GDP ratio.

Saunders and Schumacher (2000) applied the Ho and Saunders (1981) model to examine the factors that determine the bank interest rate margins in the U.S and six selected European countries. The study employed a total sample of 614 banks over the period 1988-1995. The authors considered regulatory, market structure and risk premium components as factors that affect the spread. The bank NIMs are influenced significantly by the capital to assets ratios and the reserve requirements. Their findings also suggest that maintaining a high capital adequacy ratio and customers paying less for financial services reduces the margin. The findings also show that the more the banking system is concentrated by both activity and geographically, the higher the spread as the existing banks charge monopolistic price. Moreover, the interest rate volatility had a significant influence on the bank spread. Similarly, the bank NIMs are influenced significantly by the macro interest rate volatility.

This suggests that policy that looks at reducing the interest rate volatility can obviously help reduce the spread.

Angbazo (1997) examines the link between off-balance sheet banking (OBS) activities, interest rate risk, default risks and bank net interest margins. The study employed 286 commercial banks and the Call Report data for the period 1989-1993. The results show that both the default and interest-rate risk premia influence the bank interest margin of commercial banks. The money-center banks' net interest margins are influenced by default risk, while the interest rate risk does not influence it. This finding is consistent with their largest concentration in the off-balance sheet hedging instruments and the short-term assets. On the other hand, interest rate risk influences the (super) -regional firms while these firms are not affected by the default risk. The results point to the fact that the OBS activities enhance more diversified, margin-generating asset base than equity financing or financing through deposits. Finally, the differences in the OBS exposure give the cross-sectional differences between the liquidity risk and interest-rate risk

Čihák and Podpiera (2005) examined the effects of reforms on the behaviour of domestic banks in Kenya, Uganda and Tanzania. It came to light that profit margin typically reflects the intensity of competition and that bank has a relatively higher profit margin on lending. The authors indicate that a greater proportion of the profit margin is explained by high risk premiums charged by the banks for weak market structures (infrastructure), credit risk, weak and the difficulties in enforcing credit rights. Even though foreign banks have intensified competition in the domestic banking systems in East Africa, the spread decomposition of the Tanzanian banking system suggests that large private domestic banks make more profits than the foreign banks. However, competition in Kenya is hindered due to the presence of

weak banks as they reflect relatively high profit margins after accounting for overhead costs and loan loss provisions. This is actually more serious in Kenya's largest domestic banks, which are government-owned. This situation also exists in Uganda as well.

The literature shows mixed results on bank size and interest rate spread. Ho and Saunders (1981), Poghosyan (2012) and Zuzana and Poghosyan (2011) findings show that due to economies of scale enjoyed by larger banks, they tend to pass on these benefits to their customers in a form of lower spreads. In a Ugandan study, Beck and Hesse (2009) find some evidence that larger banks in Uganda charge lower spreads suggesting scale economies. Contrary to the findings of Beck and Hesse (2009), Mensah et al (2014) and Aboagye *et al.* (2008) findings show that bank size influences the bank interest rate margin significantly on the Ghanaian banking sector.

In most countries banks can be classified as being state owned (publicly) or privately owned (foreign) in their operations. State owned (publicly) banks of a particular country, usually holds the majority of the total assets of the country's banking sector. Using country level data, La Porta et al (2002) found that in the year 1970 the state owned firms in 92 countries were associated with sluggish financial development and lower economic growth. Barth, Caprio and Levine (1999) findings suggest that more poorly developed banks, security markets and non-banks were associated with state controlled banks. Claessens *et al* (2001) findings suggest that there is a reduction in the profitability and margins for domestic banks as a result of the increased presence of foreign banks.

Dinç (2005) findings show that state owned banks lend out more credits in election years more than the private ones in key emergent markets in the 1990s as compared to the non-

election years. This is due to political reasons rather than the mere difference between government-owned banks and privately-owned banks in terms of goal and efficiency. Sapienza (2004) results indicate that in Italy the chairpersons of state-owned banks' party affiliation influence the interest rate, discount rate positively given by state controlled banks in provinces where the allied party is stronger.

Grenade (2007) examined the Eastern Caribbean Currency Union's (ECCU) interest rate spreads by carrying out the trend analysis of commercial banks. The study period was 1993-2003 and employed panel data regression technique. The analysis suggests two stylized facts. First, foreign banks exhibit higher spreads than the local banks over the study period. Second, there are little signs of the spreads lowering as they continue to show signs of rigidity. The author concluded that the high levels of operating costs, market concentration, the regulated savings deposit rate of the central bank and non-performing loans caused the observed spreads.

Aguirre et al (2013) study the interest rate spread of the Argentine financial system during the last eighteen years (1994-2013). By analyzing Granger causality of selected variables, and estimate econometric models that relate spread to macroeconomic and microeconomic factors, results indicate that output growth and monetization reduce spread during the whole period, while country risk and prices are significant only by sub-periods, suggesting changes in macroeconomic context. Banking system variables also have significant impacts, including: taxes, administrative expenses, non-performing loans, the use of own resources and liquidity.

The possible effects of financial sector reforms on the interest rate spread in the commercial banking system in Malawi was examined by Chirwa and Mlachila (2004). The study period was 1989-1999. The study made use of another definition of spread and the analysis indicates that liberalization leads to significant increase in the bank spread. The fact is that in Malawi, there is variation in the benefits enjoyed by both the depositors and the borrowers with regards to the benefits of financial liberalization. Thus, banks shift maximum part of their risk and costs to the customers. Results suggest that increases in the following variables: inflation, central bank discount rates, high levels of monopoly power and reserve requirements increases the spread. On the other hand, the entry of new commercial banks (foreign) into the Malawian financial system has not impacted much on the competition due to their relative small size and the low coverage in the market location wise.

Hinaunye and Monash (2012) investigated the factors that determine the interest rate spread in the Namibian banking sector over the period 1996-2010. The study made use of the co-integrated vector auto regression (VAR) or the multivariate co-integration methods. The results indicate that the following variables: Treasury bill rate, inflation and bank rate influence the interest rate spread positively in Namibia. Meanwhile, the interest rate spread decreases with an increase in financial deepening and the size of the economy. This shows that increase in the government interest rate policy tend to increase the bank interest rate spread. Secondly, commercial banks increase their interest rates to their customers anytime there is an increase in the cost of funds to these commercial banks. The bank interest rate spread increases with an increase in the inflation rate. To the authors, increasing the size of the economy will bring about economies of scale that will tend to reduce the bank interest rate spread. Third, the increase in competition and financial deepening can lead to interbank competition, which has the tendency to reduce the bank interest rate spread.

Poghosyan (2010) studied the bank interest margin by re-examining foreign bank participation on the margin of banks. The study considered data on 11 Central and Eastern European countries (CEECs), over the period 1995-2006. This study period witness the strongest foreign participation in these countries. The author employed the extended version of the dealer's model by Maudos et al. (2004). The author augments the model by introducing proxies for indirect and direct foreign bank participation impacts on the bank margin. Poghosyan shows that the proxies did not produce any significant results. This result confirms the assertion by Ho and Saunders (1981) on the effects of the ownership structure on the spread.

Eralp (2014) investigated the factors that determine bank interest margin and interest rate spread in Turkey. The study period was 2003-2009 and used bank level panel data of 24 commercial banks from small and closed bank markets. The study employed new macroeconomic variables to the normal variables. Their results show that both bank spreads are positively and significantly affected bank efficiency, credit risk and market power. On the other hand, the bank spread was solely affected positively by ownership, lower liquidity risk and higher reserves. The net interest margin is positively affected by lower capital risk, scale efficiency and it negatively affected by interest rate risk. Portfolio management on the other hand, has negative influence on the bank spread only. Secondly, the bank margin increases with increase in treasury securities and inflation rates. The author concluded that both researchers and policy makers must take caution when selecting variables to include in the model since banks behave differently in the determination of net interest margin and spread.

Maudos and Solis (2009) examined the factors that impact the determination of net interest income in Mexican banking sector. The study employed 43 commercial banks over the period 1993-2005. The results indicate that Mexican banking sector interest margin is about 5% compared with the international standard. The independent variables use by the authors in explaining the behavior of banking spread included inflation rate, market risk, quality of management, credit risk, operating costs, volatility of interest rates, transaction size, implicit interest payments, non-interest, GDP growth, liquidity, degree of risk aversion and cost to gross income. The findings indicate that only liquidity rate among all the independent variables included in the study does not impact the bank interest spread. The authors were in conclusion that operating costs and market power mainly accounted for the high spread observed over the period.

Maudos and Nagore (2007) explained competition in banking by looking at the impact of institutional, bank-specific, financial structure, regulatory, and macro variables. The study uses 10479 annual observations over the period 1995-1999 in 58 countries (using information at national and bank level). The Lerner index of market power was estimated. The findings suggest that the observed differences in the level of banking competition are due to the levels of financial development and market structure. Secondly, the market power is being explained largely by the bank-specific factors especially size and efficiency. Their findings also suggest that when financial development and financial structure are controlled, then the impediments of regulatory factors do not have a significant effect on competition.

Demiurgic and Huizinga (1999) examined the factors that help determine the interest margins and profitability of commercial banks. The study considered 80 countries over the period 1988-1995 and made use of bank level data. The study shows that the following

variables: institutional indicators, bank characteristics, deposit insurance, regulation, overall financial structure, macroeconomic conditions, several underlying legal and explicit and implicit bank taxation explained the differences in bank profitability and interest margins. The findings indicate that when the differences in leverage, bank activity and macroeconomic environment were controlled, then margins and profits were lower with a lower market concentration ratio and a larger bank asset to GDP ratio. The findings also indicate that foreign banks normally have higher margins and profits than the domestic banks in developing countries, whiles, the opposite holds for the industrialized countries. The finding shows that customers pay fully for the corporate tax burden. Secondly, increase in inflation leads to increase in a banks' income whiles the bank costs decreases. As indicated by Ben Khediri & Ben-Khedhiri (2009) lower interest margins and lower profitability are realized whenever there is an improvements in efficiency in the legal system, indicators of better contract enforcement and lack of corruption. Finally, results suggest that when banks are well-capitalized, they exhibit higher net interest margins and are more profitable.

Maudos et al (2004) examine the factors that explain the interest margin in the major European banking sectors (Germany, France, the United Kingdom, Italy and Spain). The study used a panel data of 15,888 observations over the period 1993-2000. Maudos and Fernandez employed the dealer's model and its extensions. The authors use all the theoretical posited factors for the determination of the margin and then inculcated into this model the average bank operating costs. Also, the study made use of Lerner index, which is the direct measure of the degree of competition in the market. The first conclusion is that the variables: credit risk, risk aversion of banks, interest rate risk, competitive conditions and average operating expenses determine the pure spread. Secondly, the results suggest

that the reduction in the competitive conditions in the markets and the reduction (or relaxation) in operating costs, interest rate risk and credit risks explains the reduction in the margins of the European banking system. The deregulation measures in the 1990s, by the European Union did not bring about competition among the banks.

Mensah and Abor (2014) examined the effects of agency problems on the interest margin in the Ghanaian banking system over the period 1999-2011. The study examines the relationship between interest rate spreads and the managerial goals and corporate goals. The authors employed the fixed-effects panel regression to study how corporate governance factors affect interest rate spreads in Ghana. Their findings suggest that bank's net margin increases with increase in executive compensation. This result suggests that managers extract more rents with the intention to balance it through charging higher margin. Moreover, the results indicate that bank interest margin increases with an increase in the following variables: the level of capital held by banks, asset size, the level of inflation, the level of concentration in the banking industry and the reserve requirement.

Were and Wambua (2012) assessed the effect of the factors that determine the interest rate spread of commercial banks in Kenya. The results indicate that high interest rate spreads is still an issue of great concern in a number of African countries, of which Kenya is no exception. The empirical results show that inflation and real economic growth do not impact the bank spread in Kenya. Bank size based on bank assets of which big banks charge higher spreads than smaller banks, liquidity risk, operating costs, returns on of average assets and credit risk are all significant in the interest rate spread model. On the regulatory level, the policy rate had a weak impact on the spread even though it exhibits positive relation with the spread.

Siddiqui (2011) employed panel data models to study the influence of bank specific factors on interest rate spread in Pakistan. The study made use of data on 14 commercial banks in Pakistan over the period 2000-2008. The finding indicates that increasing administrative costs, increasing return on assets and nonperforming loans significantly brings about an upsurge in the interest rate spread. The study reveals that in Pakistan, there exists imperfect market competition (weak banking competition).

Poghosyan (2012) examines the possible influences of the institutional, macroeconomic and regulatory factors on financial intermediation costs in low-income countries. The study compares the effects of the above mentioned determinants of the spread among the low-income countries (LICs) and the emerging markets (EMs) countries. Results indicate that the following bank-specific factors: bank size, credit risks and bank capitalization largely accounted for the variation in the interest spread in the LICs as increase in credit risk, smaller bank size and lower bank capitalization lead to higher spread. The overall results suggest that LICs financial intermediation costs failed to narrow due to institutional weaknesses, lack of competition in the banking system as a result of high level of concentrated market structures. The results suggest that designing policies that geared towards improving institutional frameworks and encouraging banking competition have a strong tendency to reduce the intermediation costs in the low-income countries.

By emphasizing on bank ownership structure, Fungáčová and Poghosyan (2009) analyzed the factors that determine the interest margin in the Russian banking sector. The study employs bank-level data covering Russia's complete banking sector for the period 1999-2007. The results show that the effect of a number of usually used determinants such as credit risk, market structure, liquidity risk and size of operations differs across domestic-

private, state-controlled, and foreign-owned banks. Secondly, operational costs and bank risk aversion impacts are similar across ownership groups. In conclusion, the authors indicated that, the overall results suggest that the form of bank ownership should be taken into accounts when analyzing the factors that determine the interest margin in non- industrial countries.

## **Conclusion**

The determinants of bank interest rate spreads include: bank-specific, macroeconomic, industry specific and regulatory factors. The bank interest rate spread is significant in any economy since it signifies the cost of intermediation. Higher level of it is detrimental to economic growth since small and medium scale enterprises find it difficult to borrow so as to expand their businesses. This can lead to high levels of unemployment in the countries in Africa. This means that various policymakers should have a critical look at the movement of this important factor. The empirics also indicate the significance of interest rate spread to the economy. Most studies conclude that the inefficiencies in banking sector accounts for higher interest rate spread is as the result of inefficiency in the banking sector (Irungu, 2013). Narrowing the spread between the lending and the deposit rates will encourage savings which in essence will promotes economic growth whiles wide spread is said to depress savings which will lead to less investments. Most of the studies discussed concentrated on the determinants of the interest rate spread, but put less notes on the possible effects of corporate governance on the spread. We therefore seek to find the effects of agency costs on bank interest rate spread in Africa.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This section presents the detailed procedural framework necessary for achieving the objectives of the study. It contains the model specification, the data sources, the variables or factors (dependent and independent) and the method used in the analysis. Secondary data is used in establishing the connection between agency costs and bank interest rate spreads in Africa. Investigating the connection between agency cost and bank interest rate spreads, a panel data regression analysis was done.

#### **3.2 Sample**

Two hundred and ten (210) banks were finally used for the study base on full data availability for the period 2006 to 2013. A total of twenty-eight (28) countries in Africa were considered for this study. This comprises five (5) in North, ten (10) in Southern and thirteen (13) in Central Africa. These countries were selected for having at least four banks with full availability of needed data.

#### **3.3 Data Sources**

Data for the study is primarily of the secondary type. It is sourced from the Bank Scope Database, World Development Indicators (WDI) of the World Bank and the Central banks of the various countries included in this study. The consolidated financial reports of the various banks (the bank-specific data) as well as other relevant information on these banks for the period 2006 to 2013 were sourced from the respective banks for the study. Bank Scope's coverage by assets is very broad in most countries. The involved banks account for approximately 90 percent of all the bank assets. A vital benefit of using Bank Scope data is

that the value of the average rates charged by an identical sector of the banking system can be calculated. This considerably advances the comparability across countries.

### **3.4 Description of Variables**

#### **3.4.1 Dependent Variables**

##### **3.4.1.1 Interest Rate Spread**

We employ two definitions for the bank interest rate spread. Spread1 (NIM) is defined as the interest income minus the interest expenses scaled over total assets (Garza-García, 2010). NIM is measured by the ex-post approach. NIM is also viewed as a good standard measure of the profitability of a bank's essential business. A higher margin could mean an exceptional management among banks in the same form of business while lower margins suggests very low deposit rate and higher costs of borrowing. Spread2 (SPRD) is the difference between the advertised average universal banks' lending rate and the average deposit rate (Kumari, 2014). This is measured by the ex-ante approach. The NIM is mainly different from the SPRD due to the lost interest revenue on the non-performing loan. This makes the spread generally higher than the NIM.

#### **3.4.2 The Independent Variables**

##### **3.3.3.1 Agency Cost Variables**

###### **3.3.3.1a Emolument**

This variable is captured by audit fees plus directors' fees (agency cost) expressed over total assets of the bank. In actual fact, a higher ratio is an indication of managers achieving their personal goals neglecting the goals of the investors. This is a symptom of agency problems since shareholders expect wealth maximization. Mensah et al (2014) indicates that emoluments impact bank's net interest margin positively, although their measure of this

variable deviates a little from ours. Therefore, we hypothesized positive relation between the bank interest rate spread and emolument (agency cost).

#### **3.4.3.1b Board Composition**

Following the approach of Mensah et al (2014), we expressed this variable in terms of the number of non-executive directors scaled over the total board size. According to Andres et al (2008), the board size has to be a mixture between the characteristics of a large board, knowledge and resources, and effective communication and coordination that characterizes smaller boards. The aspect of independent directors is particular important in agency theory because it assumes that being outside of the organization will make sure that there will be no other conflict of interest between the agent and principal and also increases the likelihood of corrective action. We therefore expect a negative relationship between this variable and bank interest rate spread.

#### **3.4.3.1c Ownership Structure of the Banks**

A bank can have local/state or foreign ownership. In this study, we are interested in the foreign ownership. Foreign banks obtain higher margins in developing countries than in the developed countries (Demirguc-Kunt & Huizinga, 2000). Zuzana and Poghosyan (2009) indicate that there are differences in incentives and different approaches in setting margins as a result of the difference in bank ownerships. Following the approach of Mensah et al (2014), we defined the ownership structure in terms of foreign ownership (a dummy variable taking a value of 1 if foreigners hold more than 50% of the total assets of the bank and 0 otherwise-local ownership). We hypothesize a negative relation between foreign ownership and bank interest rate spreads (foreign ownership to exhibit lower margin) since they have more resources, better technology and more able staff compared to local banks.

### **3.4.3.2 Bank Specific Variables**

To allow for variations in the banking sector, we include three banks-specific factors to allow for any bank-level differences.

#### **3.4.3.2a Bank Size**

We use the natural log of total assets of the bank as a measure of bank size. This variable depicts the likelihood of economies of scale in banking. This variable has received mixed results. Fungacova and Poghosyan (2009) found negative relation between this variable and the margin and that, increase in economies of scale enjoyed by larger bank results in lower margins. On the other hand, the larger the size of operations, the higher the risks associated with single customers and the higher the margin (Aboagye et al, 2008; Maudos & Fernandez de Guevara, 2004; Mensal et al, 2014). We therefore hypothesized that increase in bank size should lead to lower bank spread. We expect larger banks to enjoy economies of scale and therefore, exhibit lower margins as they are likely to pass this benefit to their customers.

#### **3.4.3.2b Quality of Management (Management Inefficiency)**

The quality of management variable was proxied by cost-to-income ratio. A higher ratio indicates inefficient management. As indicated and shown by Angbazo (1997), Aboagye et al (2008), Mensah et al (2014) and Maudos and Fernandez (2004) that, a good (efficient) management produces more at low costs. We hypothesized a positive relation between bank management inefficiency and interest rate spread since inefficient banks will normally pass on their inefficiencies to their clients in a form of higher margins as shown by Agbloyor, Abor, Adjasi, and Yawson, (2013).

### **3.4.3.2c Credit Risk**

The tendency for non-repayment of credit by customers' calls for the banks applying a risk premium indirectly on the interest rate charged to borrowers in their operations. We used loan loss provisions scaled over total loans to cater for credit risk. It is normally expected that firms that advance loans to customers are more prone to credit risk and this variable exhibit positive relationship with the spread. A lot of studies found out that the bank interest margins increase with increase in bank credit risks (see Angbazo, 1997; Maudos & Fernandez, 2004; Carbo Valverde & Rodriguez Fernandez, 2007). We hypothesized that increase in this ratio will have a positive impact on the bank interest rate spreads.

### **3.4.3.3 Macroeconomic Factors**

The macroeconomic determinants of bank interest rate spread used in this study justify for the influences of the macro-policy and macroeconomic uncertainty on banking sector interest rate spread. We employed three variables: inflation rates, the volatility of market interest rate and the real exchange rate to capture the macro-environment in our model.

#### **3.4.3.3a Inflation Rate**

Inflation, which reflects changes in the consumer price index, increases the cost of living. Following the approach of Aboagye et al. (2008), Mensah et al. (2014) and Gregory and Hambusch (2015), we proxy inflation by the changes in the consumer price index (CPI). It characterizes the cost of doing business in an economy (Poghosyan, 2010). There is evidence of bank interest rate spreads being correlated with inflation in some previous studies (see Honohan, 2003; Crowley, 2007; Mensah et al, 2014; Aboagye et. al, 2008, Chirwa & Mlachila, 2004). We hypothesize that a higher inflation should be positively correlated with bank interest rate spread.

#### **3.4.3.3b Interest Rates Volatility**

As indicated by Maudos et al (2004) the uncertainty in the money markets is captured in the theoretical model by the deviations in the market interest rates. Maudos et al (2004) argue that empirical proxy of this variable is accordingly based on a measurement of the volatility of market interest rates such as the standard deviation (SD). Following the works of Maudos et al (2004) and Mensah et al (2014) we proxy this variable by the standard deviation of the 91 day Treasury bill rate. The variations in the interest rates indicate that banks take in more risks. Therefore, banks will exhibit higher spreads to compensate for this level of risk. We postulate that, there will be a positive relation between the volatility of the market interest rates and the bank interest rate spread.

#### **3.4.3.3c Exchange Rate**

An exchange rate (or the nominal exchange rate) represents the relative price of two currencies. Banks experience foreign exchange risks as a result of adverse movements in foreign exchange rates. Folawewo et al (2008) and Mensah et al (2014) found a positive relation between exchange rate and bank interest margins. We expect bank interest rate spreads to increase with an appreciating US dollar. The justification is that when the dollar is appreciating (or depreciation in the local currency) indicates that banks are taking on a larger currency risk by investing or lending in a currency that is depreciating.

#### **3.4.3.4 Regulatory Factors**

We employed two variables to take care of the effects of the regulatory requirements on the bank interest rate spreads. Namely: bank risk-aversion and the bank reserve requirement.

#### **3.4.3.4a Bank Risk-Aversion**

We measure this variable by using the deviations between the actual equity held by banks and the minimum capital adequacy ratio (CAR) scaled over total assets. This is the deviation from the approach used by McShane and Sharpe (1985), Aboagye et al (2008), Chen and Liao (2011), Mensah et al (2014) and Maudos et al (2004) who measured this variable by equity to total assets ratio. Keeping minimum capital base serves to encourage the solidity and effectiveness of the banking system by preventing insolvency. According to the dealer's model, the more risk adverse firms keep more equity in their capital structure and hence will require higher margin in their operations. This is in line with the standard finance theory which states that financing through equity is more expensive than financing through debt. Therefore, we expect an increase in this variable to be positively associated with bank interest rate spread.

#### **3.4.3.4b Reserve Requirement**

This variable is measured as the reserves of banks with the central banks scaled over total assets. This reserve requirement is used as fiscal policy instrument to maintain the soundness of the banking system but comes with costs to banks. This is due to the fact that their loanable funds reduce and hence a reduction in revenue. Maudos et al (2009) and Maudos et al (2004) argue that reserve requirement represents an opportunity cost to the banks and therefore, are compensated for by charging higher margins to their customers. Mensah et al (2014) also confirmed that in Ghana, universal banks retort to increases in this variable by increasing their margins and in Brazil by Afanasieff, Lhacer and Nakane (2002). We expect that an increase in banks' reserves requirements will lead to higher spread.

### 3.4.3.5 Industrial Specific Factor

Following the approach of Aboagye et al (2008) and Mensah et al (2014) we use the Herfindahl Hirschman index (HHI) for assets to measure the market structure of the banking industry. Empirically, accepted measure for the market structure is the HHI, which captures the level of concentration (competition) in the banking sector of an economy (see Aboagye et al 2008; Mensah et al, 2014; Maudos et al, 2004). This index is measured as the sum of squares of the market shares. The total assets capture the banking activity. The HHI ranges from 0 to 1 with higher levels, indicating high market concentration and less levels showing competitive banking sector. We expect a positive relation between the HHI and bank net interest spreads since the fewer the market players in the market, the more likely they are to charge monopolistic price. Thus:

$$HHI_{it} = \sum S_{it}^2$$

**Table 3.1:** indicates the summary of the various determinants of the IRS with their description and expected signs as well.

VARIABLE	PROXY/DESCRIPTION	PREDICTED COEFFICIENT SIGN
<b>Dependent Variables-Bank Interest Rate Spread</b>	Spread1= (interest income –interest expenses) /total assets. Spread2=Average banking lending rate minus average deposit rate	N/A  NA
<b>Governance Variables</b>		
<b>Emolument</b>	(audit cost + directors’ fees)/total assets	Positive
<b>Board composition</b>	Non-executive directors/total board size	Negative
<b>Foreign ownership</b>	This is a dummy variable which takes the value of 1 if foreigners own more than 50% of the shares of a bank and 0 otherwise.	Negative
<b>Bank specific variables</b>		
<b>Bank size</b>	Expressed as the log of the total bank assets	Negative/Positive
<b>Management inefficiency</b>	Defined by costs to income ratio	Positive
<b>Credit risk</b>	Ratio of loan loss provisions to total loans	Positive
<b>Regulatory factors</b>		
<b>Bank risk-aversion</b>	It is defined by deviations between actual bank equity and minimum capital requirement/total assets	Positive
<b>Bank Reserve requirement</b>	Total reserves with central banks/total assets	Positive
<b>Industrial specific variable (HHI)</b>	Is defined as the sum of squares of the market shares (expressed as a fraction) of all banks in the industry.	Positive
<b>Macroeconomic factors</b>		
<b>Inflation</b>	Indicates the percentage changes in the CPI	Positive
<b>Exchange rate</b>	Measures the value the US dollar in relation to the various currencies in Africa	Positive
<b>Volatility of interest rates</b>	Measures as the annual standard deviation of the three month treasury bill rates	Positive

### 3.5 Model Specification

The methodology to be applied to this data is borrowed from the dealer's model by Ho and Saunders (1981). In the determination of the bank interest margin they adopted a model of bid-ask prices of securities in the market. This model depicts that the ideal margin that the banks will charge depends mainly on four factors. Namely: degree of bank risk aversion, the average size of bank transactions, the variance of interest rates, and the market structure in which the bank operates. The model also assumes that banks are risk adverse dealers that request for deposits and providing credits to customers. According to Ho and Saunders (1981), the spread is expressed as:

$$S = a + b = \frac{\alpha}{\beta} + \frac{1}{2}R\sigma^2_1Q \quad 1$$

Where  $s$  is the pure spread,  $\alpha/\beta$  captures the banks risk neutral spread which is lower in competitive markets. The first order risk-adjusted term depends on three factors and is captured by the second term. These factors are: (i)  $R$ , the coefficient of the banks' management risk aversion. (ii)  $Q$  captures the bank size of operations; (iii)  $\sigma^2_1$  represents the immediate variations of the interest rate on deposit and loan. Net inventory is the variation in the market value of the banks' loan and deposit. The bank invests excess deposit in money market instruments. Similarly, the bank borrows from money markets to finance its loan requests if it does not have the fund to meet this demand.

The basic model was extended by other authors, including Allen (1988), introduced multiple loans and deposits and Angbazo (1997) considers default risk and interest rate risk premium as possible factor in the spread determination and McShane and Sharp (1985) introduced into the model the uncertainty in the money market. The model was later extended by

Maudos et al (2004) in which they introduced average operating cost, a credit risk component and covariance of the interest rate risk and credit risk.

We employ a ‘single stage’ panel regression to explain the impact of agency costs on bank interest rate spread in Africa. We hypothesized that the bank interest rate spread is a function of agency costs, bank specific, macroeconomic, regulatory and industry specific variables.

$$Spread = f(AC, BS, MS, RS, IS, \mu_{it}) \quad 2$$

Where, *AC*, *BS*, *MS*, *RS*, *IS* and  $\mu_{it}$  are agency cost, bank specific, macro specific, regulatory specific, industry specific factors and the error term respectively.

Following the works of Aboagye et al (2008), Tennant and Folawewo (2008), Crowley (2007), Poghosyan (2012), Mensah et al (2014) and Maudos and Fernandez (2004) and to explain this relationship by the two definitions of spread (spread1 and spread2) we use the following empirical models.

$$SPRD1_{it} = \beta_1 EMOLUM_{it} + \beta_2 BCOMPP_{it} + \beta_3 F_{it} + \beta_4 MGT_{it} + \beta_5 LLP_{it} + \beta_6 SIZE_{it} \\ + \beta_7 INFL_t + \beta_8 INTVOL_t + \beta_9 EXCH_t + \beta_{10} RISK AVER_{it} + \beta_{11} BRES_{it} \\ + \beta_{12} HHI_{it} + \lambda_t + \nu_i + \varepsilon_{it} \quad 3$$

$$SPRD2_{it} = \alpha_1 EMOLUM_{it} + \alpha_2 BCOMPP_{it} + \alpha_3 F_{it} + \alpha_4 MGT_{it} + \alpha_5 LLP_{it} + \alpha_6 SIZE_{it} \\ + \alpha_7 INFL_t + \alpha_8 INTVOL_t + \alpha_9 EXCH_t + \alpha_{10} RISK AVER_{it} + \alpha_{11} BRES_{it} \\ + \alpha_{12} HHI_{it} + \gamma_t + \delta_i + \vartheta_{it} \quad 4$$

Where,  $I = 1 \dots 210$  and  $t = 1 \dots 8$  and *I* represents cross-sectional dimension and *t* representing time series dimension. *SPRD1IT* is net interest margin at time *t*, *SPRD2IT* is interest rate spread at time *t*, *EMOLUMIT* is emolument (agency cost), *BCOMPPIT* represents board composition, *Fit* represents foreign ownership of bank, *MGTIT* represents the bank management efficiency, *LLPIT* indicates the loan loss provision ratio, *SIZEIT*

the size of the bank, *INFLT* is the inflation rate (CPI), *INTVOLT* represents the interest rate volatility, *EXCHT* represents exchange rate, *RISKAVERIT* represents the risk aversion of the management, *BRESIT* stands for the regulatory reserve requirements and *HHI<sub>it</sub>* measures the level of concentration in the banking industry. The parameters to be estimated are  $\beta_1$  to  $\beta_{12}$  and  $\alpha_1$  to  $\alpha_{12}$ .  $\lambda_t$  ( $\gamma_t$ ) is the unobserved time specific effect,  $v_i$  ( $\delta_i$ ) is the unobserved individual specific effect and  $\varepsilon_{it}$  ( $\vartheta_{it}$ ) represents the remaining disturbance term.

### 3.6 Estimation Strategy

An unbalanced panel estimation method was applied to the data. Given the results of Hausman specification test, the fixed effects model was the preferred estimation technique over the random effect estimation technique for both spread 1 and spread 2 since the test statistic ( $\text{Prob}>\text{Chi}^2 = 0.0003$  and  $\text{Prob}>\text{chi}^2 = 0.0000$ ) are less than 0.05. Due to the presence of heteroskedasticity we employed the Prais-Winsten (1954) estimation technique which is a generalized least-squares method that estimates the parameters in a linear regression model in which the errors are serially correlated. It does not lose the first observation and leads to more efficient results. The panel corrected standard errors (PCSE) of this GLS produces coefficient and standard error estimates that are efficient and unbiased (Reed & Webb, 2010). This GLS is robust to heteroscedasticity and autocorrelation. The assumptions of the approach include the error terms are identically and independently normally distributed and the error terms show first order serial correlation and all error processes are homoscedastic.

Beck and Katz (1995 page 645) found that PCSE estimator is more efficient than the Feasible Generalized Least Squares (FGLS) since it is able to produce precise standard

errors than the FGLS. We used statistical package (Stata 13.0) to carry out the tests, estimation of the models, and to the determination of the actual degrees of freedom.

### **3.7 Conclusion**

This chapter presents the detailed procedural used in examining the effects of agency costs or the impact of agency costs on bank interest rate spread in Africa in using the panel data information for the period, 2006-2013. Thus, panel data models provide far more information than using either time series or cross sectional data model because theoretical literature suggest that it is possible to separate the effects of specific influences and actions (Hsiao, 2007). We employed bank – level data to estimate equations relating to the two definitions of spread (the ex-post and the ex-ante approaches) with corporate governance variables and the control variables as independent variables.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

The main aim of this study is to explain the effects of agency costs on bank interest rate spread in Africa. This chapter presents results and discussions from the descriptive statistics, correlation coefficients and all estimations. We discussed the results in relation to our set objectives and hypotheses of the study.

#### 4.2 Descriptive Statistics for Africa

Table 4.1 Summary statistics of all the variables on the full data (Africa) used in this study.

The table depicts the number of observations, the mean, the standard deviations, minimum and maximum values of the variables used for the study.

**Table 4.1: Summary statistics**

<i>VARIABLE</i>	<i>OBS.</i>	<i>MEAN</i>	<i>STD. DEV.</i>	<i>MIN.</i>	<i>MAX.</i>
<i>SPRD1</i>	1508	0.067341	0.055303	-0.0574	0.619
<i>SPRD2</i>	1680	0.078374	0.043558	0.003	0.276
<i>EMOLUM</i>	1614	0.014363	0.015138	0.000103	0.110593
<i>BCOMPP</i>	1630	0.768139	0.098246	0.333	1
<i>F</i>	1680	0.380952	0.485766	0	1
<i>MGT</i>	1516	0.571725	0.186243	0.033	0.998
<i>LLP</i>	1171	0.059784	0.071424	0.001	0.567
<i>SIZE</i>	1607	6.431287	1.652005	2.303	11.75
<i>INFL</i>	1673	0.087794	0.055976	-0.011	0.444
<i>INTVOL</i>	1260	0.017238	0.026617	0	0.141
<i>EXCH</i>	1680	258.4975	607.9817	0.916	4349.16
<i>BRES</i>	1595	0.172275	0.133961	0.007	0.987
<i>RISKAVER</i>	1598	0.05413	0.126962	-0.22651	0.9
<i>HHI</i>	1680	0.161147	0.164221	0.001	0.847

*Source: Bank scope, WDI, Central banks and Own elaborations*

The average values for spread1 and spread2 for the study period are about 6.7% and 7.8% respectively in our dataset. This indicates that the difference between the lending and the deposit rates is high in the banking industry of Africa. Over the period of the study, the minimum spread1 was -5.74% and spread2 was 0.3% whilst the maximum was 61.9% for spread1 and 27.6% for spread2. The emolument (audit costs and directors' fees) in all accounts for 1.5% of bank assets in Africa. The mean value of the board composition is 76.8%. This suggests that the non-executive directors form 76.8% of the board of directors of banks in Africa indicating a substantial part of the board of directors. This is an indication that executive directors are in the minority when it comes to board representation in banks in Africa. The foreign controlled banks form about 38.1% of all banks in Africa for the study period. This indicates that foreign investors play key role in the total banking sector in Africa.

On the control variables specific to the statement of financial position structure, credit risk mean is 6% of gross loans of African banks. This implies that a loan default is a problem in the banking sector in Africa. On the average the banks operating cost is about 57.2% in Africa. The average of the bank size in our data set is about 643.1 million dollars. Our data set suggests that the banking industry in Africa is moderately concentrated with average Herfindahl index value of 0.16 (16%). The bank risk aversion is averaged about 5.4%, suggesting that banks maintained a comfortable margin above the CAR required by the Central Bank. The banks' reserve over the period has averaged 17.2%. The inflation rate over the study period has averaged 8.8% with a minimum of -1.1% and a maximum of about 44.4%. This suggests that Africa's inflation is high. The average of the interest rate volatility of the period is 1.7% with a maximum of 14.1%. This is no new news since investing in treasury bills represent investment in risk-free assets which is government debt and normally

should be less risky compared to other asset classes. The average value of the U.S Dollar was 258.50 per the currencies used for the study with a minimum 91.6 and a maximum of 4349.16. This, indeed, shows how significantly the African currencies have depreciated against the US\$.

### **4.3 Correlation Matrix**

Table 4.2 Correlation Matrix for Africa

The correlation matrix shows the linear independence of the independent variables examined as indicated in the table above. The Pearson product moment coefficient of relation for pairs of explanatory variables depicts the amount of linear link between two or more variables. From the table it is clearly seen that no pairs of variables have a value above 0.50 (50%). Secondly, almost all the variables exhibited the expected signs with the dependent variables with the exception of the market concentration (HHI).

**Table 4.2: Correlation matrix for Africa**

	SPRD1	SPRD2	EMOLUM	BCOMPP	F	MGT	LLP	SIZE	INFL	INTVOL	EXCH	BRES	RISKAVER	HHI
SPRD1	1													
SPRD2	0.3055	1												
EMOLUM	0.0554	0.0679	1											
BCOMPP	-0.1182	-0.1082	-0.0166	1										
F	-0.0548	0.0998	-0.0481	-0.2015	1									
MGT	0.1492	0.1971	0.1502	0.0196	0.0698	1								
LLP	0.0715	-0.0524	0.1216	0.0173	-0.0784	0.0888	1							
SIZE	-0.3085	-0.3796	-0.3187	-0.0152	-0.049	-0.3894	-0.0176	1						
INFL	0.1326	0.3197	0.0618	0.0062	-0.0337	-0.0074	-0.014	-0.1632	1					
INTVOL	0.2206	0.3432	-0.0123	-0.0609	0.0612	0.1187	-0.0156	-0.132	0.1886	1				
EXCH	0.166	0.1476	-0.0742	-0.0224	0.0741	0.2222	-0.0175	-0.3116	0.0403	0.1547	1			
BRES	0.0621	0.1291	0.1626	-0.0282	0.1617	0.0981	-0.006	-0.3551	0.1309	0.009	-0.0302	1		
RISKAVER	0.138	-0.0454	0.1074	0.086	-0.0972	-0.067	0.1786	-0.2397	0.0044	-0.0544	-0.0828	0.0732	1	
HHI	-0.1237	-0.0737	-0.0447	-0.0453	0.0398	-0.1156	-0.1001	0.1054	0.0967	-0.1525	-0.2089	0.1685	-0.0214	1

*Spread1 (SPRD1) is the interest income minus interest expenses scaled over total assets. Spread2 (SPRD2) is the average universal banking lending rate minus average deposit rate. Emolument (EMOLUM) is audit cost + directors' fees scaled over total assets. Board composition (BCOMPP) is non-executive directors/total board size. Foreign ownership (F) is a dummy variable which takes the value of 1 if foreigners own more than 50% of the shares of a bank and 0 otherwise. Bank size (SIZE) is expressed as the log of the total bank assets. Management inefficiency (MGT) is defined by the ratio of costs to income. Credit risk (LLP) is the ratio of loan loss provisions to total loans. Inflation (INFL) indicates the percentage changes in the CPI. Exchange rate (EXCH) measured the value of the US dollar in relation to the various currencies in Africa. Volatility of interest rates (INTVOL) measured as the annual standard deviation of the three month Treasury bill rates. Bank risk-aversion (RISKAVER) is defined by deviations between actual bank equity and minimum capital requirement/total assets. Bank reserve requirement (BRES) is total reserves with central banks/total assets. Herfindahl Hirschman index (HHI) is defined as the sum of squares of the market shares (expressed as a fraction) of all banks in the industry.*

#### 4.4 Descriptive Statistics for the Blocks

**Table 4.3: Descriptive Statistics for North African Countries**

<i>VARIABLES</i>	<i>OBS.</i>	<i>MEAN</i>	<i>STD. DEV.</i>	<i>MIN</i>	<i>MAX</i>
<i>SPRD1</i>	313	0.04221	0.03306	-0.0574	0.2777
<i>SPRD2</i>	320	0.050303	0.015027	0.023	0.075
<i>EMOLUM</i>	320	0.013927	0.014029	0.001071	0.106363
<i>BCOMPP</i>	320	0.786719	0.09386	0.45	1
<i>F</i>	320	0.2	0.400627	0	1
<i>MGT</i>	311	0.46628	0.173671	0.138	0.96
<i>LLP</i>	188	0.101229	0.089754	0.001	0.477
<i>SIZE</i>	320	7.591744	1.578816	4.522	10.939
<i>INFL</i>	320	0.082666	0.059384	0.023	0.374
<i>INTVOL</i>	240	0.011121	0.013025	0	0.05
<i>EXCH</i>	320	21.75736	29.74369	1.232	79.368
<i>BRES</i>	320	0.130944	0.100318	0.01	0.478
<i>RISKAVER</i>	319	0.050468	0.099063	-0.22651	0.486569
<i>HHI</i>	320	0.054363	0.049851	0.002	0.275

Source: Bank Scope, Central Banks, WDI and Own Computation.

**Table 4.4: Descriptive statistics for Central African Countries**

<i>VARIABLE</i>	<i>OBS.</i>	<i>MEAN</i>	<i>STD.DEV.</i>	<i>MIN.</i>	<i>MAX.</i>
<i>SPRD1</i>	593	0.076903	0.055759	0.0002	0.619
<i>SPRD2</i>	672	0.095652	0.037695	0.003	0.213
<i>EMOLUM</i>	644	0.011591	0.010247	0.000348	0.09859
<i>BCOMPP</i>	643	0.754981	0.10088	0.333	1
<i>F</i>	672	0.428571	0.49524	0	1
<i>MGT</i>	607	0.603774	0.167417	0.142	0.995
<i>LLP</i>	451	0.05867	0.067754	0.001	0.567
<i>SIZE</i>	643	5.940036	1.210817	2.398	9.337
<i>INFL</i>	665	0.095205	0.067512	-0.011	0.444
<i>INTVOL</i>	504	0.021618	0.03582	0	0.141
<i>EXCH</i>	672	438.9685	811.4552	0.916	4349.16
<i>BRES</i>	640	0.175927	0.125763	0.007	0.972
<i>RISKAVER</i>	640	0.041514	0.094299	-0.08932	0.809091
<i>HHI</i>	672	0.148838	0.151599	0.001	0.746

SOURCE: Bank Scope, Central Banks and Own Computation

**Table 4.5: Descriptive statistics results for South African Countries**

<i>VARIABLE</i>	<i>OBS.</i>	<i>MEAN</i>	<i>STD. DEV.</i>	<i>MIN.</i>	<i>MAX.</i>
<i>SPRD1</i>	602	0.070988	0.060055	-0.0176	0.5366
<i>SPRD2</i>	688	0.074554	0.049706	0.03	0.276
<i>EMOLUM</i>	650	0.017325	0.018768	0.000103	0.110593
<i>BCOMPP</i>	667	0.771909	0.096085	0.333	1
<i>F</i>	688	0.418605	0.493689	0	1
<i>MGT</i>	598	0.594032	0.191248	0.033	0.998
<i>LLP</i>	532	0.046083	0.060955	0.001	0.44
<i>SIZE</i>	644	6.345151	1.788031	2.303	11.75
<i>INFL</i>	688	0.083016	0.038663	0.003	0.281
<i>EXCH</i>	688	192.3352	444.4167	3.603	1600.44
<i>INTVOL</i>	516	0.015804	0.01902	0.0004	0.0951
<i>BRES</i>	635	0.189424	0.151473	0.007	0.987
<i>RISKAVER</i>	639	0.068593	0.161789	-0.08246	0.9
<i>HHI</i>	688	0.222837	0.181764	0.011	0.847

*Source: Bank Scope, Central Banks and Own Computation*

The average spread1 (spread2) for the study averages about 4.2%, 7.7% and 7.1% (5%, 9.6% and 7.5%) for the blocks North, Central and South respectively as against the full sample (Africa) average of 6.7% (7.8%) in our dataset. This indicates a high spread between the lending and deposit rate. This indicates that the spread in central Africa is above the overall spread for Africa. Over the period of the study, the minimum spread1 (spread2) are -5.7%, 0.2% and -1.8% (2.32%, 0.3% and 3.03%) whilst the maximum spreads are 27.8%, 61.9 and 53.7% (7.47%, 21.27% and 27.6%) for the blocks North, Central and South African countries respectively. The emolument (Audit costs and directors' fees) accounted for 1.4%, 1.2% and 1.7% of bank assets in North, Central and South African countries respectively. These results show that the average emolument of South African countries is above the average of the whole data set. Non-executive directors are a considerable constituent of the

board of directors of banks in the blocks North, Central and South African countries accounting for 78.7%, 75.5% and 77.2% respectively of the total board size. This means that the executive directors form the smaller part of the board of directors of banks in Africa. The foreign controlled banks form about 20% of banks in North African countries, 42.9% in central and 41.9% in the south for the study period. This indicates that foreign investors play key role in the total banking sector in Africa.

On the control variables, loan loss provisions forms about 10.1% of the assets of North African countries banks, 5.9% of bank assets in central Africa and that of South Africa 4.6%. Thus, the average for the North African countries is above the average for Africa. Bank operating costs on the average form about 46.6%, 60.4% and 59.4% of assets in respective blocks in Africa. The figures for central and South African countries are above the overall average for Africa. The bank size figure averages 760, 590 and 630 for North, central and South African countries respectively. Our data suggest that the banking industry in North African countries is competitive with an HHI value of 0.05 (5%), that of central Africa is moderately concentrated with an HHI figure of 0.15 (15%) and South African countries is concentrated having an HHI value of 0.22 (22%). The bank risk-aversion (deviations between capital adequacy ratio and actual equity held by the banks) averaged about 5%, 4.2% and 6.9% of North, Central and South African countries respectively suggests that banks maintained a comfortable margin above the CAR required by the Central Banks. The banks' reserve requirement over the period averaged 13.1%, 17.6% and 18.9% for north, central and South African countries respectively. The averages of inflation for the blocks over the period of study are 8.3%, 9.5% and 8.3%. The average interest rate volatility is 1.1%, 2.2% and 1.6% for North, Central and South African countries respectively for the study period. This is not news since investing treasury bills represent investment in risk-free

assets which is government debt and normally should be less risky compared to other asset classes. The average values of the exchange rate (the value of the US\$) for our data set are 21.76, 438.968 and 192.33 for north, central and South African countries respectively for the study period, 2006 to 2013.

#### **4.5 Correlation Matrix for Blocks in Africa**

From the tables it is clearly seen that no two pairs of the variables have correlation values above 0.70. Almost all the variables exhibited the expected signs with the dependent variables with the exception of HHI and LLP. Interest rate volatility (INTVOL) has the highest correlation of 0.44 with the dependent variable in countries in central African countries. In North African countries, the market structure exhibited the highest correlation with the dependent variable with a value of 0.59. Inflation (INFL) exhibits the highest correlation with the dependent variable with a coefficient of 0.44 in South African countries.

**Table 4.6: Correlation Matrix for North African Countries**

	SPRD1	SPRD2	EMOLU M	BCOMPP	F	MGT	LLP	SIZE	INFL	INTVOL	EXCH	BRES	RISKAVE R	HHI
SPRD1	1													
SPRD2	0.3935	1												
EMOLUM	0.1315	0.1252	1											
BCOMPP	0.0527	-0.0603	0.0498	1										
F	-0.0474	0.0201	-0.1135	0.0234	1									
MGT	-0.1382	-0.0782	0.203	0.0964	-0.1259	1								
LLP	-0.4063	0.0589	0.2486	-0.0403	0.065	0.2999	1							
SIZE	-0.401	-0.3659	-0.4734	-0.0785	0.1557	-0.1032	-0.1472	1						
INFL	0.1002	0.2856	0.1937	-0.0519	-0.0449	0.1222	-0.0425	-0.1536	1					
INTVOL	-0.2638	-0.3014	0.1343	0.0273	0.1019	0.1473	0.3381	0.0272	-0.0864	1				
EXCH	0.2321	0.4735	-0.1886	-0.0218	-0.0042	-0.2583	-0.2436	-0.1213	-0.2973	-0.468	1			
BRES	0.4381	0.3399	0.1692	0.0251	-0.1116	0.1641	0.1118	-0.4101	0.0431	-0.0879	0.1267	1		
RISKAVE R	0.3071	0.3381	0.1438	0.0851	-0.1187	-0.2807	-0.2734	-0.5243	0.0432	-0.2165	0.4443	0.1457	1	
HHI	-0.4063	-0.5913	-0.2956	0.0146	0.002	0.014	-0.0192	0.5653	-0.1046	0.1498	-0.481	-0.3719	-0.3908	1

*Spread1 (SPRD1) is the interest income minus interest expenses scaled over total assets. Spread2 (SPRD2) is the average universal banking lending rate minus average deposit rate. Emolument (EMOLUM) is audit cost + directors' fees scaled over total assets. Board composition (BCOMPP) is non-executive directors/total board size. Foreign ownership (F) is a dummy variable which takes the value of 1 if foreigners own more than 50% of the shares of a bank and 0 otherwise. Bank size (SIZE) is expressed as the log of the total bank assets. Management inefficiency (MGT) is*

defined by the ratio of costs to income. Credit risk (LLP) is the ratio of loan loss provisions to total loans. Inflation (INFL) indicates the percentage changes in the CPI. Exchange rate (EXCH) measured the value of the US dollar in relation to the various currencies in Africa. Volatility of interest rates (INTVOL) measured as the annual standard deviation of the three month Treasury bill rates. Bank risk-aversion (RISKAVER) is defined by deviations between actual bank equity and minimum capital requirement/total assets. Bank reserve requirement (BRES) is total reserves with central banks/total assets. Herfindahl Hirschman index (HHI) is defined as the sum of squares of the market shares (expressed as a fraction) of all banks in the industry

**Table 4.7: Correlation Matrix for Central African Countries**

	SPRD1	SPRD2	EMOLUM	BCOMPP	F	MGT	LLP	SIZE	INFL	INTVOL	EXCH	BRES	RISKAVER	HHI
SPRD1	1													
SPRD2	0.3233	1												
EMOLUM	-0.0912	0.1046	1											
BCOMPP	-0.0042	-0.0642	-0.0245	1										
F	-0.0847	0.0295	-0.0678	-0.2036	1									
MGT	0.0999	0.1706	0.0162	-0.0252	0.1285	1								
LLP	0.0217	0.0248	0.0256	0.0966	-0.0313	0.0834	1							
SIZE	-0.0916	-0.1388	-0.1834	-0.171	-0.0254	-0.3591	-0.0915	1						
INFL	0.1276	0.2104	0.068	0.0922	-0.1129	-0.1732	-0.0249	-0.1076	1					
INTVOL	0.3429	0.4402	0.0228	-0.1317	0.0702	0.0883	-0.0265	-0.0182	0.1628	1				
EXCH	0.1943	0.0412	0.0586	-0.0202	0.0765	0.2238	0.106	-0.3063	-0.0548	0.0346	1			
BRES	-0.0819	0.1275	0.1498	0.0699	0.1786	-0.0268	0.1175	-0.3612	0.252	0.0204	-0.0937	1		
RISKAVER	0.0875	0.0486	0.236	0.2225	-0.125	-0.0192	0.0842	-0.353	0.1106	-0.0086	-0.0422	0.2138	1	
HHI	-0.1945	-0.2616	-0.0746	-0.0885	-0.0335	-0.3518	0.0177	0.2749	0.2857	-0.1755	-0.1983	0.231	-0.0886	1

**Table 4.8: Correlation Matrix for South African Countries**

	SPRD1	SPRD2	EMOLUM	BCOMPP	F	MGT	LLP	SIZE	INFL	EXCH	INTVOL	BRES	RISKAVER	HHI
SPRD1	1													
SPRD2	0.1796	1												
EMOLUM	0.1308	0.1163	1											
BCOMPP	-0.2279	-0.0781	-0.0622	1										
F	-0.1328	0.0628	-0.0281	-0.2531	1									
MGT	0.1392	0.1068	0.2194	0.097	-0.0211	1								
LLP	0.3705	-0.0082	0.1992	-0.066	-0.1453	0.163	1							
SIZE	-0.3107	-0.3735	-0.3945	0.0189	-0.0037	-0.3916	-0.1269	1						
INFL	0.1406	0.5477	0.0509	-0.0584	0.0687	0.1086	0.0114	-0.2364	1					
EXCH	0.0178	0.0828	-0.1785	0.074	-0.011	0.1925	-0.1276	-0.321	0.25	1				
INTVOL	0.0653	0.2511	-0.0473	0.0877	-0.0207	0.0887	-0.0994	-0.24	0.399	0.4364	1			
BRES	0.0333	0.0569	0.1628	-0.1095	0.1708	0.0806	-0.0225	-0.3029	0.027	-0.0205	-0.026	1		
RISKAVER	0.1506	-0.1049	0.0363	-0.0006	-0.0893	-0.0399	0.4568	-0.1639	-0.0991	-0.1467	-0.0757	-0.0176	1	
HHI	-0.2205	-0.0636	-0.0898	-0.0002	-0.0061	-0.2054	-0.0401	0.1852	-0.0355	-0.4002	-0.2696	0.0931	-0.007	1

**Table 4.9: Stability and Diagnostic Test**

Test	Spread 1	Spread 2
Normality	Shapiro-Walk statistic = 6.298 P-value = 0.0000	Shapiro-Walk statistic = 1.36 P-value = 0.12795
Autocorrelation	Wooldridge statistic = 50.642 p-value = 0.0000	Wooldridge statistic = 93.395 p-value = 0.0000
Heteroskedasticity	LM test statistic = 1.6e+31 p-value = 0.0000	LM test statistic = 1.5e+32 p-value = 0.0000
Multicollinearity	VIF = 1.26	VIF = 1.26
Hausman	Chi2 = 32.37 p-value = 0.0003	Chi2 = 49.99 p-value = 0.0000

From table 4.9 above the results of the stability and diagnostic tests are shown. The null hypothesis of normality of residuals is only rejected if the  $p$ -value is less than the 0.05 significance level. The test results show that with the two dependent variables spread1 shows normality and spread 2 depicts no normality. Serial correlation tests were conducted using the Wooldridge test. The results show the presence of autocorrelation. We performed heteroskedasticity tests using the White's test. The Lagrangian Multiplier ( $LM$ ) test statistics are bigger than the critical values and the  $p$ -values are also less than the significance level of 0.05. This indicates the presence of heteroskedasticity in all the models. The Hausman test was conducted to show whether to run fixed effect or random effect regression and the results rejected the null hypothesis suggesting that we can have a fixed effect regression run.

Even though, a correlation matrix was conducted, but for a more robust check, we also examined the presence of multicollinearity among the independent variables by employing the variance inflation factors (VIFs) computed as the inverse of  $(1 - R^2)$ . The presence of multicollinearity and it being a problem depends on whether the VIFs exceed 10. The VIFs

obtained are all below the threshold of 10. This suggests that multicollinearity is not a problem with this study.

#### 4.5 Regression Results for Africa

##### 4.5.1 Agency Costs Variables and the Interest Margin in Africa

We present the regression results below by first looking at the first objective for the study, which aimed at explaining the effects of the agency costs proxy by the variables: emolument, board composition and ownership structure (foreign) on bank interest rate spread in Africa for the period, 2006-2013.

**Table 4.10: Regression results for Africa. The full table with the p-values is shown under appendix.**

<i>VARIABLE</i>	<i>SPREAD1</i>		<i>SPREAD2</i>	
	COEFF.	STD. ERR	COEFF.	STD. ERR
EMOLUM	0.123379*	0.065782	0.233198***	0.08969
BCOMPP	0.025998***	0.0070220	0.046615***	0.00712
F	0.000805	0.002627	0.012981***	0.00334
MGT	0.039049***	0.005837	0.060815***	0.00634
LLP	0.033687*	0.020026	-0.05795***	0.01698
SIZE	0.000734	0.000699	-0.00016	0.00059
INFL	0.041371***	0.010374	0.074211***	0.01275
INTVOL	0.078687***	0.021418	0.092616*	0.04923*
EXCH	0.000012***	2.69E-06	-1.04E-06	2.00E-06
BRES	0.014956*	0.008361	0.011945*	0.00723
RISKAVER	0.094127***	0.01776	0.016416	0.01234
HHI	-0.00533	0.005362	-0.17849***	0.006036
<i>R.SQ</i>	0.7712		<i>R.SQ</i>	0.831
<i>WALDCHI2</i>	3768		<i>Waldchi2</i>	4376
<i>PROB&gt;CHI2</i>	0.0000		<i>Prob&gt;chi2</i>	0.0000
<i>D.O.F</i>	11, 766		<i>D.O.F</i>	11, 767

Source: bank scope, central banks, WDI and own computation. Where \*, \*\* and \*\*\* represent 10%, 5% and 1% significant levels respectively. D.O.F is degree of freedom.

The performances of our models are great. In model1 (spread1), the changes in the independent variables accounted for 77.21% of the variation in the interest rate spread. In model2 (spread2), the changes in the independent variables accounted for 83.1% of the variation in the interest margin.

Our results from table 4.10 above indicate that emolument is one of the key variables that enter the empirical model. This variable is positive and significant in all the models estimated for spread 1 and spread 2. Thus, the bank interest spread (net interest margin) will increase with an increase in emoluments. The results suggest that a 1% increase in emolument will significantly (at 10% and 1% significant levels) increase the spreads (spread1 and spread2) by 0.1233787% and 0.233198% respectively. This is an indication that emoluments are considered when banks are setting their interest rates. Our results show that banks' agency cost contributes to the high spread in Africa.

The results of this study, thus, suggests the fact that when the goals of the bank owners and management are not aligned, this contributes to the significantly explanation of the high interest rate spread in Africa. Thus, in trying to align the goal of the management and the owners, a cost is involved which in essence affect the spread. Mensah et al (2014) found a positive relation between interest margin and emoluments for Ghanaian bank. In a related development, when we decomposed this variable into audit costs and directors' fees and run separate regressions, however the results show that these variables are not significant in both models. The results are shown under appendix.

**Table 4.11: Regression with only the agency variables**

<i>VARIABLE</i>	<i>COEFF.</i>	<i>STD.ERR</i>	<i>COEFF.</i>	<i>STD.ERR</i>
<i>EMOLUM</i>	0.1579***	0.05807	0.2726***	0.0629
<i>BCOMPP</i>	0.0782***	0.00266	0.0833***	0.0026
<i>F</i>	0.0042	0.00303	0.0237***	0.0034
<i>R-SQUARE</i>	0.5372		0.6399	
<i>WALDCHI2</i>	1755		2351	
<i>D.O.F</i>	(2, 1246)		(2, 1361)	
	SPREAD1		SPREAD2	

Moreover, in trying to appreciate the real effect of the agency variables on the spread, we estimated the dependent variables on only the agency variables. This result shows that these variables are indeed significant.

Board composition which is measured as a ratio of the non-executive directors to the total board exhibits positive relation and is significant in the spread1 and spread 2 models for Africa. As indicated above the majority of the board members are non-executive directors and do not have an affiliation with the managers of these firms hence can monitor the selfish behaviour of the managers. In doing so there can be a reduction in the tendencies that leads to the extraction of rents and other forms of diversions that tend to increase the spread. This result is in tandem with that of Mensah et al (2014) who found positive and significant relation with the bank interest margin.

The ownership structure (foreign owned) of the banks in Africa is significant in spread 2 model but is not significant in spread 1 model. The bases or levels of interest income and interest expenditures vary from one type of ownership to the other type of ownership. Apparently, banks of not the same type of ownerships have diverse motivations as well as diverse policies when fixing their margins. In the case of inefficiency, foreign banks are

more likely to pass this to their customers through higher margin but this is not likely to happen with the state banks since they are normally involved in social projects and public enterprise lending. Our results are in line with the studies by Fungacova and Poghosyan (2009) who finds similar results. Demirguc-Kunt and Huizinga (2000) found that foreign banks get higher margins than domestic banks in developing countries but realize lower margins in the industrialized economies.

#### **4.5.2 Interest Rate Spread and Other Variables (Bank Specific, Macro Variables, Regulatory Variables and the Industry Specific)**

In line with our second objective which aimed at re-examining the effects of the above mentioned variables on the determination of bank interest rate spread in Africa and check whether these variables affect the spread1 and spread 2 equally. The table 4.10 above gives the regression results to that effect.

We start with the bank specific variables used in this work. The management quality (inefficiency) shows evidence of statistical significance with the spread1 and spread2. The quality of management (management inefficiency) (*MGT*) variable is positive and significant to both spread 1 and spread 2 as hypothesized. This is so because banks with a higher ratio of this variable are considered to be inefficient, hence charge higher margins to compensate for their incompetence. That is to say that the management can pass on their inefficiency to customers by charging higher margins. The findings of Poghosyan (2012) indicate that the less efficient banks exhibit higher operating costs which translate into higher margins. This result is in tandem with studies by other authors who found a positive relationship between operating costs and interest rate margins in developed countries: Garza-García (2010) for six developed and eight developing countries study, Fernandez de

Guevara (2004) for Spanish banks and Maudos and Fernandez de Guevara (2004) for European banks with Maudos and Solis (2009) for Mexico banks. Gockel and Mensah (2006) and Mensah et al (2014) found positive results and Aboagye et al (2008) found a negative result for their studies in Ghana.

In a similar vein, the credit risk proxy by the loan loss provisions scaled over total loans (LLP) is statistically significant in both models, but positive in spread 1 model and negative in spread2 model. The negative coefficient in spread 2 may imply that banks are under provisioning. Secondly, the negative coefficient of this variable may also suggest that banks take necessary steps to either reduce the deposit rate or increase the loan rates to achieve a higher net margin. This result agrees with the findings of Kari Grenade (2007) in her study of the determinants of interest rate spread of commercial banks in the eastern Caribbean currency union, Barajas et al (1999) for Latin America and Aboagye et al (2008) in Ghana. However, the positive result in spread 1 indicates that bank interest margin increase with an increasing credit risk. Thus, it is ideal for risky banks to charge higher margins than less risky ones. This finding is in line with the results of Maudos and Fernandez (2004) and Poghosyan (2012) who found similar results from their study.

Bank size is not significant in either estimated models, but positively related in spread1 model and negatively related to spread2 model. The positive relationship with spread shows that, bigger banks tend to show a higher spread as related to minor banks. In fact, this indicates that larger banks are likely not benefiting from economies of scale. Indeed, larger banks invest in technology and branch networks, hence are compensated by charging higher margins. This finding is consistent with the findings of Mensah et al (2014) and Aboagye *et al* (2008) who found that bank interest margin increases with an increasing bank size in the

Ghanaian banking system and Maudos and Solis (2009) for banks in Mexico. On the other hand, the negative relation with spread<sub>2</sub> suggests that larger banks charge lower margins as compared to the smaller ones since the larger banks benefit from economies of scale. This means that the more they expand or produce the lesser the costs becomes. This result is in tandem with Maudos and Fernandez (2004) and Horvath (2009) who found similar results for the studies in the European and Czech Republic banking systems respectively.

There is enough information that shows that all the three macroeconomic factors employed in the study really impact bank interest rate spread in Africa. Inflation (INFL) and interest rate volatility (INTVOL) are positively and significantly in both a spread<sub>1</sub> and spread<sub>2</sub> while the exchange rate is significant in both model 1 but is positive in spread<sub>1</sub> and negative in spread<sub>2</sub>. The results of the macroeconomic variables indicate that changes in inflation could lead to higher spreads by increasing the risk premium that banks need to charge. This is an indication that inflation is one of the key variables that enter the model for bank spread in Africa. There will be no net influence of inflation on the interest margin if both deposit and lending rates move in the same direction any time there a change in the inflation rate. The result, however, suggests that the lending rates of banks more regularly increase with increases in inflation at the expense of the deposit rates. This implies that bank net interest margins increases with an increase in inflation. This supports the findings of Aboagye *et al.* (2008), Mensah *et al.* (2014), Chirwa and Mlachila (2004), Bawumia *al.* (2005) and Beck and Hesse (2009).

The interest rate volatility shows the expected sign as predicted by the theoretical model. It has positive and significant impact on both spread<sub>1</sub> and spread<sub>2</sub>. This result suggests that banks will always work with a higher spread anytime Treasury bill rates go higher. This is

an indication that Treasury bill rates are determinant factor in the determination of the lending rates and hence the spread at large since banks will always pair their lending rates above the Treasury bill rates. This result is in tandem with the findings of Maudos and Fernandez (2004), Mensah et al (2014). On the contrary, Crowley (2007) findings show that the bank interest rate spread decreases with increasing interest rate volatility. Crowley explained that this relationship is so because banks prefer to invest in the treasury bills than in risky assets like loans anytime the Treasury bill rates goes higher. As a result of this, the interest rate spread narrows.

Exchange rate positively and significantly impacted the spread1 model. This means that an appreciating US Dollar will impact the spread in such a way that banks need more of their local currency more than before to meet certain transactions. In other words, a country with a depreciating currency will probably experience higher margin. This result is in tandem with the findings of Mensah et al (2014). Moreover, the negative coefficient of this variable recorded in the spread2 model suggests that the local currency is appreciating against the US currency hence a possible reduction in the spread. This stands to say that a country with appreciating currency is more likely to have lower spread.

We also find evidence that both spread1 and spread2 are affected positively by the reserve requirements of banks implemented by the monetary authority to promote financial stability. These reserves show the portion of deposits that banks have to keep with the Central Bank. The banks do not normally have access to these funds to lend out to people so as to get returns. Banks do not gain returns at all or very little returns from these reserves, hence represent a cost to them. In view of this, banks compensate themselves by charging higher margins for not having access to these funds to grant loans to customers. This, therefore,

indicates that bank's interest margin will likely lowered if the reserves are reduced. Our findings support the results of Mensah et al (2014), Bawumia *et al* (2005) and Maudos and Fernandez de Guevara (2004).

Moreover, we found out that increase in banks' risk aversion (RSKAVER- measured as the deviation between the actual equity held by the banks and the minimum CAR scaled over total assets) leads to increase in the spread and is significant in the spread1 model whiles this variable is not significant in spread2 model. This tends to suggests that, banks exhibit higher margins as they keep more equity in their capital structure. This result is intuitive either in that banks have to earn higher net interest margins in order to maintain higher capitalization ratios, or in that higher net interest margins result in higher capitalization ratios. As indicated by the standard finance theory that, debt is less expensive than equity. Banks have to charge higher margins to compensate for higher equity held. Findings of previous studies obtained similar results (see Angbazo, 1997; Mensah et al, 2014; Aboagye et al, 2008; Saunders & Schumacher, 2000; Amidu & Wolfe, 2012; Fungacova & Poghosyan (2011); Maudos & Guevara, 2004). Ho and Saunders (1981) made a point that a higher capital base is a consequence of greater margins as risk exposure increases.

We find evidence that contradicts what the theoretical model predicted for the market structure variable. The industry level variable proxy by concentration (HHI) shows negative and significant relation with the spread2 but not significantly with spread1. A banking system is more concentrated (less competitive) with a higher value of this variable (HHI). Our results in model 2 suggest that the banking sector in Africa does not consider the market structure in setting their interest rates. This negative relation indicates that the competitive nature of the banking sector does not encourage monopolistic rents and thus shows lower

margins. This is also an indication that clients of larger banks enjoy only a small fraction of their savings from the economies of scale achieved by these banks. This is true for all banks and indicates that the market is contestable.

In other words, higher concentration is a consequence of tougher competition among banks (Boone & Weigand, 2000). A likely rationale is that more efficient banks work with lower costs, serve the best-quality borrowers and have greater market share, thereby forcing less efficient banks to consolidate and charge competitive interest margins through the reduction of operating costs. This result is in line with what was obtained by Beck and Hesse (2006), Arreaza et al (2001), with Kiguel and Okseniuk (2006) citing Chile as an example of a country that bears the lowest spreads in the region together with high banking concentration.

Crowley (2007) finds negative relation between concentration and bank interest margin, giving the reasons that more diverse banking systems may be more common in countries with well supervised financial sectors since both may be associated with greater financial sector development. Secondly, smaller and more diversified banks could be less efficient if they do not benefit from economies of scale or if they do more business with small clients, so they might have to charge higher spreads. Or more diversified banks might simply be able to charge higher spreads because their differentiation would give them more market power. On the contrary, Maudos et al (2004), Aboagye et al (2008), Mensah et al (2014), Zuzana and Poghosyan (2009) found a positive as well as significant relation between the bank interest rate spread and the HHI.

**Table 4.12: North African Countries Stability and Diagnostic Test Results**

Test	Spread 1	Spread 2
Normality	Shapiro-Walk statistic = 8.211 P-value = 0.0000	Shapiro-Walk statistic = 2.201 P-value = 0.01387
Autocorrelation	Wooldridge statistic = 0.743 P-value = 0.3960	Wooldridge statistic = 23.848 P-value = 0.0000
Heteroskedasticity	LM test statistic = 4496.36 P-value = 0.0000	LM test statistic = 282.63 P-value = 0.0000
Multicollinearity	VIF = 1.81	VIF = 1.81
Hausman	Chi2 = 41.22 P-value = 0.0003	Chi2 = 87.59 P-value = 0.0000

**Table 4.13: Central African Countries Stability and Diagnostic Test Results**

Test	Spread 1	Spread 2
Normality	Shapiro-Walk statistic = 4.523 P-value = 0.0000	Shapiro-Walk statistic = 5.840 P-value = 0.00000
Autocorrelation	Wooldridge statistic = 27.323 P-value = 0.0000	Wooldridge statistic = 119.808 P-value = 0.0000
Heteroskedasticity	LM test statistic = $6.6e^{+30}$ P-value = 0.0000	LM test statistic = $3.9e^{+31}$ P-value = 0.0000
Multicollinearity	VIF = 1.31	VIF = 1.31
Hausman	Chi2 = 37.01 P-value = 0.0001	Chi2 = 64.45 P-value = 0.0000

**Table 4.14: South African Countries Stability and Diagnostic Test Results**

Test	Spread 1	Spread 2
Normality	Shapiro-Walk statistic = 7.059 P-value = 0.00000	Shapiro-Walk statistic = 4.685 P-value = 0.00000
Autocorrelation	Wooldridge statistic = 69.217 P-value = 0.0000	Wooldridge statistic = 84.800 P-value = 0.0000
Heteroskedasticity	LM test statistic = 72837.43 P-value = 0.0000	LM test statistic = 6.6e+30 P-value = 0.0000
Multicollinearity	VIF = 1.53	VIF = 1.53
Hausman	Chi2 = 30.37 P-value = 0.0007	Chi2 = 109.29 P-value = 0.0000

#### 4.5.3 Regression Results for the Blocks (North, Central and South Africa)

**Table 4.15: Regression Results for North African countries. The full table with the p-values is shown under appendix.**

VARIABLE	SPREAD1		SPREAD2	
	COEFF.	STD. ERR.	COEFF.	STD. ERR.
EMOLUM	-0.2812	0.1717	0.4901**	0.2348
BCOMPP	0.0273**	0.0112	0.0172	0.0126
F	-0.0015	0.0032	0.0048	0.0042
MGT	0.0168 *	0.0088	0.0559 ***	0.0102
LLP	0.0668**	0.0321	-0.0201	0.0330
SIZE	0.0062***	0.0011	0.0086 ***	0.0014
INFL	0.0251**	0.0125	0.0640***	0.0190
INTVOL	0.1059 ***	0.0267	0.1510 ***	0.0585
EXCH	0.0001***	0.00003	-4.7e-06**	1.9E-05
BRES	-0.0084	0.0113	0.0683 ***	0.0168
RISKAVER	0.1249***	0.0266	-0.0021	0.0209
HHI	-0.0519***	0.0096	-0.1245 ***	0.0150
R-SQUARE	0.8703		0.9185	
WALDCHI2 D.O.F	2853.95 (11,121)		4574 (11, 122)	

Source: bank scope, central banks, WDI and own computation. Where \*, \*\* and \*\*\* represent 10%, 5% and 1% significant levels respectively.

**Table 4.16: The Regression Results for Central African countries. The full table with the p-values is shown under appendix.**

<b>VARIABLE</b>	<b>SPREAD1</b>		<b>SPREAD2</b>	
	<b>COEFF.</b>	<b>STD.ERR</b>	<b>COEFF.</b>	<b>STD.ERR</b>
<b>EMOLUM</b>	-0.2811547	0.1717295	0.4901463**	0.234784
<b>BCOMPP</b>	0.0272875**	0.011158	0.0172219	0.012567
<b>F</b>	-0.0014767	0.0031641	0.0047529	0.00423
<b>MGT</b>	0.016765*	0.0088223	0.0559227***	0.010157
<b>LLP</b>	0.0667812**	0.0321488	-0.0200599	0.032974
<b>SIZE</b>	0.00623***	0.0011431	0.008566***	0.001399
<b>INFL</b>	0.0250901**	0.0124914	0.0639682***	0.019002
<b>INTVOL</b>	0.1059426***	0.0266859	0.1509838***	0.058462
<b>EXCH</b>	0.0000146***	0.0000338	-4.77e-06**	1.99E-05
<b>BRES</b>	-0.0084095	0.0113352	0.0682814***	0.016779
<b>RISKAVER</b>	0.1249056***	0.026644	-0.002105	0.020888
<b>HHI</b>	-0.0519395***	0.0096031	-0.1244799***	0.014974
<b>R-SQUARE</b>	0.8703		0.9185	
<b>WALDCHI2</b>	2853.95		4574	
<b>D.O.F</b>	(11, 281)		(11, 281)	

Source: bank scope, central banks, WDI and own computation. Where \*, \*\* and \*\*\* represent 10%, 5% and 1% significant levels respectively

**Table 4.17: Regression Results for South Africa Countries. The full table with the p-values is shown under appendix.**

VARIABLE	SPREAD1		SPREAD2	
	COEFF.	STD.ERR	COEFF.	STD.ERR
EMOLUM	0.183562*	0.0960963	0.404679***	0.098218
BCOMPP	0.04543***	0.0123865	0.056474***	0.009695
F	0.005191	0.0042612	0.011705***	0.002849
MGT	0.021618**	0.0093708	0.014374**	0.006145
LLP	0.188504***	0.0531948	0.065909***	0.02532
SIZE	-0.001161	0.0012108	-0.00198***	0.000734
INFL	0.131832***	0.032628	0.167857***	0.024783
EXCH	-0.0000058	0.00000405	3.15E-06	3.04E-06
INTVOL	-0.017037	0.0404846	-0.16239***	0.039463
BRES	0.0343581***	0.0117262	-0.00044	0.006524
RSKAVER	0.0277887	0.0235222	-0.03565***	0.008863
HHI	-0.0133765	0.0086541	0.004471	0.004471
RSQ.	0.7535		0.8786	
WALDCHI2 D.O.F	2319.37 (11, 342)		3816.57 (11, 342)	

Source: bank scope, central banks, WDI and own computation. Where \*, \*\* and \*\*\* represent 10%, 5% and 1% significant levels respectively

In line with our third objective of the study, which sought to estimate the differences in the bank interest spread among the blocks (north, south and central) in Africa in terms of the variables employed in the study, the above tables 4.15- 4.17 depict to that effect. The aim of this objective is to determine the blocks contribution to African's high spread and to verify whether variables that determine the bank interest rate spread in Africa cut across these blocks.

Emolument (agency costs) is significant in both spread1 and spread2 for South African countries and only significant in the spread2 model for Central African countries while its impact is not felt in either model of North African countries, though there exist a positive relation between emolument (agency costs) and the bank interest rate spread. This result

suggests that in North African countries, emolument does not affect the nature of spread. The effect of board composition in both models does cut across all the blocks considered in this study with a significant value of zero ( $p\text{-value} = 0.0000$ ). The ownership structure (foreign ownership) is significant in only in the spread2 model for South African countries. Our result is in line with the studies by Fungacova and Poghosyan (2009) who finds similar results. Demirguc-Kunt and Huizinga (2000) finds that in developing countries, foreign banks obtain higher margins than their domestic counterparts' while they realized lower margins in the developed countries.

With regards to the three bank specific variables employed in this study, the results shows that management inefficiency is significant in model 2 and cut across all three blocks used but significant with spread1 in Central and South African countries. This result suggests that the quality of management is really significant in the determination of the bank margins in these blocks. The loan loss provisions to total assets ratio (proxy for credit risk) has significant impact on spread1 in all the three blocks, but is significant with spread2 in North and South African countries. Bank size is also significant in the two models. This is an indication that the bank specific variables are also key factors that affect the spread in Africa. This is so because banks operating at higher cost must charge a high margin to compensate for that high cost. Secondly, banks with risky assets (loans) must have to charge high interest rates so as to compensate for the default loans. Third, larger banks charge a higher margin than their smaller banks. This suggests that larger banks do not enjoy economies of scale.

With regards to the three macroeconomic variables employed in this study, our results show that inflation (INFL) positively and significantly impact both spreads in all the three blocks. This result is in line with the results obtained in Africa as a whole. With the three variables showing the expected signs and significance across these two blocks indicate how important

these variables are in the determination of bank interest rate spread. This is an indication that the dealer's model predictions are indeed right. The interest rate volatility is has a positive and significant relationship with the two spreads in central African countries and significant with spread2 in South African countries as well. The exchange rate is significant and impacts the spread in central and North African countries but does not have a significant impact on the spread in South African countries.

The regulatory variables employed in this study results show the bank management risk aversion is positive and significant with spread1 in both Central and North African countries, with spread2 in North and South African countries respectively. Bank reserves are also significant and impact the banking sectors spread (with spread1) in North and South African countries, with spread2 in Central and North African countries respectively. Finally, we find evidence that the industry specific variable is significant and impact spread in Central and North African countries. This result affirms what was predicted and obtained by Ho and Saunders (1981).

#### **4.6 Conclusion**

This chapter presents the analysis and discussions of the effects of agency costs variables on the bank interest rate spread in Africa, controlling for bank specific, macroeconomic and other factors. To avoid or alleviate the issues of heteroskedasticity the study made use of the Panel Corrected Standard Errors (PCSE) model of the Generalized Least Squares (GLS) which is robust to heteroskedasticity and autocorrelation. In addition to finding significant effects agency costs variables on the interest rate spread, we also re-examine the effects of macroeconomic, bank specific, industry specific and regulatory factory on bank interest rate spread in Africa. All the variables used for the study were also tested block wise to testify

their significance among these blocks. Our findings suggest that the earlier variables hypothesized by the dealer's model for the determination of the bank interest rate spread is really relevant as of today. The results on the agency costs also point the same direction of their significance in the determination of the spread in Africa. The chapter that follows presents the other key findings, policy implications as well as future research direction.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

The main goal of this study is to explain the effects of agency costs on bank interest rate spreads in Africa. This chapter presents results and discussions from the descriptive statistics, correlation coefficients and all estimations. We discussed the results in relation to our set objectives and hypotheses of the study. However, recommendations are provided with some policy guidelines to alleviating or narrowing the high bank interest rate spread in Africa.

#### 5.2 Summary

The study explained the effect of agency problems and agency costs variables (emolument, board composition and bank ownership) on the high bank interest rate spreads in Africa for the period, 2006-2013. The study also re-examined the effects of the other factors predicted by the dealer's model in the determination of the bank interest rate spread and compared the effects of these variables on the spreads across north, central and south African countries. The study employed two hundred and ten (210) banks in twenty-eight countries in Africa. The study tested the hypotheses that there are no effects of the agency cost variables on the high spreads in Africa, no statistical significance of the theoretical predicted variables on the spreads in Africa and there are no differences in the bank interest rate spreads in terms of the blocks. The findings indicate that, for the study period, Africa's spreads averages 6.7% (7.8%), emolument (agency cost) averages 1.7%, board composition is 77.1%, foreign bank ownership is 38.1%, banks operating costs averaged 57.2%, inflation averages 8.8%, exchange rate average is 258.50 in relation to the US Dollar, while interest rate volatility,

reserve requirements, bank risk aversion and the market structure (concentration) area averaged 1.8%, 10%, 14.5% and 16.11% (0.1611) respectively.

Our regression results show a positive and significant relationship between emolument and bank interest rate spread<sup>1</sup> and spread<sup>2</sup> in Africa. This means that the agency cost variable is considered in setting of the interest rate spreads in Africa. The agents (managers) have a habit of charging a higher net interest margin since they have the motive of taking more rents from the banks (for instance, in terms of directors' fees). Such levels of remunerations are obviously an indicator of the agency problem that occurs between principals (shareholders) and agents (managers). Inculcating this variable into the theoretical model will not be out of place due to its significance as shown in this work. The banks that operate with higher average working expenses in this case emoluments (agency costs) find it essential to charge high spreads to enable them offset their higher operation costs. This study throws light on the fact that the agency costs contribute significantly to the observed high spreads in Africa. That is to say that, the costs involved in trying to align the goals of management and owners has influence on the spreads in Africa's banking system.

The observed coefficient for the foreign owned banks is positive for both spreads. This indicates that these banks take advantage of their distinctive situation in the markets as well as the good impressions of the people by taking comparatively higher margin in very less competitive areas. We also found that strong non-executive directors can help reduce the interest rate spread in Africa through strong supervision and monitoring of the selfish behaviour of the bank managers. Thus, they can help reduce the level of high spread associated with high and unaccepted level of emoluments that feeds into the spread model.

In relation to bank specific factors we found out two things. First, banks operate with high costs and therefore have to pass this inefficiency to their customers in a form of high spreads. These results provide some form of backing to the structure conduct performance (SCP). The SCP states that, banks normally pass their low efficiency (high operating costs) to their customers. Second, findings indicate that smaller banks rather operate with a lower spread as compared to the larger banks with respect to spread<sup>1</sup>. Larger banks operating with this higher spreads indicate that they have to be compensated for their heavy investments in new levels of technology and infrastructural developments as well. This suggests that larger banks do not benefit fully from economies of scales in their operations.

It is interesting to note that all the three macroeconomic variables play an important part in explaining the high spread in all the models for both spread<sup>1</sup> and spread<sup>2</sup> in Africa. High inflation is generally associated with an unstable and unpredictable economic environment. This means that, higher inflation is expected to lead to higher spreads if it encourages banks to charge risk premium. Therefore, reducing the level of inflation is likely to lower the bank interest rate spread in Africa. However, our results suggest that it is possible that a larger economy allows for greater specialization and deeper financial markets in which riskier borrowers have better access to funds. But this scenario is only expected to occur if the economy is already at high levels of private sector access to financial products. Similarly, a possible reduction in the T-bill rates are more likely to lead to lower spread in Africa.

At the regulatory level, with regards to the bank risk-aversion of banks in Africa, the results depicted a positive relation with both spread 1 and spread 2 as well as been significant in the spread<sup>1</sup> model. Per our definition of this variable suggests that on average, banks in Africa hold equity of about 5.4% above the minimum capital requirements. This means that

banks that fear to take risks will normally keep more equity in their capital structure and, their managers' resort to secure their deposit base by offering higher deposit rates in order to lower profit variability. Bank interest rate spreads increase with increasing bank reserves. This suggests that higher levels of reserves required by banks can obviously lead to higher spread and vice versa. The bank reserves are also positive and significant with both spread1 and spread2 suggesting that banks in Africa have to exhibit higher margins as a form of reward for the loss of revenue due to their inability to have access to these reserves to give to customers in a form of loans.

Our findings show a negative relationship between the market structure (HHI) and both spread 1 and spread 2. This is also an indication that clients of larger banks enjoy only a small fraction of their savings from the economies of scale achieved by these banks. Thus, banks in very low competitive markets enjoy monopolistic prices since they tend to conspire. But, our results suggest that high banking concentration in Africa does not encourage monopolistic prices in the banking sector.

Finally, with the purpose of testing for differences among the blocks (north, central and south African countries) in explaining the effects of the agency costs on bank interest rate in Africa we assessed the explanatory equation of the interest spreads (spread 1 and spread 2) separately for each of the blocks banking sectors considered and the results as shown in the previous chapter. Table 5.1 below gives the summary of the key findings of agency costs and other variables on effect on the spreads in the blocks used in this study. The results suggest that there are variations amongst the blocks in terms of the significance or otherwise of the variables employed in relation to the two definitions of spreads.

**Table 5.1: Significance or otherwise of the variables with the spread 1 and spread2**

VARIABLE	NORTH AFRICA		CENTRAL AFRICA		SOUTH AFRICA	
	SPREAD1	SPREAD2	SPREAD1	SPREAD2	SPREAD1	SPREAD2
EMOLUM	+?	+?	-?	+/	+/	+/
BCOMPP	+/	+/	+/	+?	+/	+/
F	+?	+?	-?	+?	+?	+/
MGT	+?	+/	+/	+/	+/	+/
LLP	-/	+/	+/	-?	+/	+/
SIZE	+?	+/	+/	+/	-?	-/
INFL	+/	+/	+/	+/	+/	+/
INTVOL	-?	+?	+/	+/	-?	-/
EXCH	+?	+/	+/	+/	+?	+?
BRES	+/	+/	-?	+/	+/	+?
RISKAVER	+/	+/	+/	-?	+?	+/
HHI	-/	-/	-/	+/	-?	+?

Source: Own computation. Where +/, -/, +? And -? Represent positive and significant, negative and significant, positive but not significant and negative but not significant respectively.

### 5.3 Conclusion

The primary aim of this thesis (study) is to explain the effects of agency costs on the high interest rate spreads in Africa, to re-examine the significance of the factors predicted by the dealer's model as the determinants of the spread in Africa and to check whether these factors affect the blocks in Africa in a similar manner in relation to the two definitions of spreads. The main findings of the study indicate that really, agency costs affect the determination of bank interest rate spread in Africa. Thus, emoluments (agency costs) contribute immensely to the observed high spreads in Africa. The ownership structure of banks can help explain the differences in spreads among the banks and the blocks in Africa. Board composition of strong base of non-executive directors can help check the selfish interest nature of bank management in pursuing their parochial agenda. This will help bring down some of costs

incurred thereby reducing the effects of emolument associated with the high spreads in Africa.

The findings also indicate that the main determinants of the observed high spreads in Africa are management inefficiency (high costs- to- income ratios), high credit risk, inflation, interest rate volatility, exchange rate (depreciation of local currency against the US Dollar), bank reserves and bank risk-aversion as well as the market structure in which the banks operate. This stands to say that maintaining macroeconomic stability, such as low and stable inflation, in a way will lower information asymmetries, allowing banks to charge reasonable lending rates and improve resource allocation efficiency thereby lowering the spreads in Africa. Secondly, with lower levels of Treasury bill rates the tendency for spreads to move down is possible. Contrastingly, market structure, presents an inverse relationship with interest rate spreads suggesting that increasing in banking sector concentration does not encourage monopolistic prices.

The overall results indicate that the bank interest rate spread in Africa widen with an increase in emoluments (agency costs), management inefficiency, inflation, bank risk-aversion, interest rate volatility, and bank reserves. However, the margin widens with the exchange rate in spread1 model, widens with credit risk (loan loss provision) in spread2 model, but reduces with increasing credit risk in spread2 model and with exchange rate appreciation in spread2 model. The banking sector concentration increases result in a reduction in the spreads. The results indicate that the variables posited in the theoretical model as explanatory of the interest margin are in overall significant and are still relevant in the determination of bank interest rate spreads in Africa. Moreover, the findings suggest that not all factors or determinants of spread affect the two definitions of spreads equally.

This is seen in the instance where the market power variable is significant in spread2 model only, banks risk aversion is also significant in the spread1 model only, the exchange rate is also significant in spread1 model only and the ownership variable is only significant in spread2 model only. That is to say in choosing the determinants of the spread, one has to be careful in selecting the necessary factors to include in a respective model. The preliminary results indicate that Central African countries contribute a higher percentage to the recorded higher spreads for Africa. It is followed by South African countries with North African countries contributing the least percentage to the recorded higher spreads for Africa.

Apparently, this study has explained the importance of the agency costs in relation to the determination of bank interest rate spread in Africa. Besides, it contributes to the literature by introducing a new measure of bank risk-aversion and pointing out the difference in the bank interest rate spreads determinants as well the differences and significances of these factors in relation to the blocks (north, central and south) in Africa.

#### **5.4 Recommendations**

The interest rate spread is an important variable to monitor, both in terms of financial stability and of money and credit market conditions; this is even more so in the economies of Africa where there exist teething problems in the financial development. If appropriate measures are not put in place the high bank interest rate spread will lead to institutional inefficiency of the financial systems in Africa. The findings of this study, therefore permit us to make the following recommendations:

- ❖ Since emolument (agency cost) feeds highly into the spreads determination models, bank regulators and board of directors must ensure that the level of these emolument is cut down to a reasonable limit that will not tend to influence high spread in Africa.

This can be attained by holding on to efficient and more compatible incentive compensation packages. Secondly, the board of directors should ensure that their supervisory roles are adhered to so as to reduce the tendency of these managers pursuing their managerial goals at the expense of the shareholder wealth maximization.

- ❖ To help contribute to the reduction of interest rate spread in Africa, then it is essential for the policymakers to hold on to policies that would help reducing credit and market risks, increase bank managements efficiencies, and encouraging competitive environment in the banking systems by allowing more foreign entries or developing other distribution networks for banking services such as internet banking, mobile banking, sales terminal points, ensuring that markets are more competitive, banks' put in more efforts to reduce their average operating costs (improving their efficiency levels).
- ❖ At the regulatory level, policymakers must ensure that the reserve requirements and the capital adequacy ratios levels do not push these financial institutions to charge higher margins but, must also ensure financial stability as well. This tend to suggests that reviewing the CARs upwards will not in any way help the banks reduce the interest rate margins.
- ❖ Inflation and interest rate volatility feed into the model by registering the higher significance, hence the managers of the various economies in Africa should ensure that the level of inflation are brought down by adhering to prudent fiscal discipline in the terms of the management of the economies. The Treasury bill rates must be

managed in such a way that it will not cause lending rates to move upwards always. That is to say that not reviewing the T-bill rate upwards regularly will help reduce the spread since universal banks always set their lending rate base on the bill rate. The economies should as a matter of agency be managed in such a way that will reduce the high level of government deficits and its attendant effects.

- ❖ It is recommended that bank management should organize regular trainings in areas like credit management, risk management and financial analysis. This would sharpen the knowledge and skills of credit officers so as to improve on the quality of credit appraisals, enable credit officers appreciate the need to comply with credit policy and further enhance the monitoring of credit.
- ❖ Empirical models should be chosen with cautious for academic and policy studies since determinants and significance of the bank net interest margin and spread can be different.
- ❖ It is recommended that Central Banks, which are the Regulatory Authorities of commercial banks in the various countries should apply stringent regulations on the interest rates charged by commercial banks so as to regulate their interest rate spread and also they should come up with rigorous policies on loan advances so as to mitigate moral hazards such as insider lending and information asymmetry. Reducing lending rates will encourage small and medium enterprises to grow thereby boasting economic growth and development.

### **5.5 Further Research Directions**

Although the study has achieved the intended purpose, it would not be wrong for further studies on the same issue by rather using a different approach to the study by increasing the sample size. Secondly, it will not be out of place if the issue of financial inclusion in Africa is examined thoroughly as being a possible factor in contributing to the high spread in Africa. Further study can also look at whether the deepening of democracy affects the level of spread. Other researchers can consider dividend payment effects on the banking sector spread in Africa.

## REFERENCES

- Abedifar, P., Molyneux, P., & Tarazi, A. (2013). Risk in Islamic banking. *Review of Finance*, rfs 041.
- Aboagye, A. Q., Akoena, S. K., Antwi-Asare, T. O., & Gockel, A. F. (2008). Explaining Interest Rate Spreads in Ghana\*. *African Development Review*, 20(3), 378-399.
- Afanasieff, T. S., Lhacer, P. M., & Nakane, M. I. (2002). The determinants of bank interest spread in Brazil. *Money Affairs*, 15(2), 183-207.
- Agbloyora, E. K., Abor, Y. J., Adjasi, C. K. D., & Yawson, A. (2013). Exploring the causality links between financial markets and foreign direct investment in Africa, *Research in International Business and Finance*, 28, 118– 134.
- Ahokpossi, M. C. (2013). Determinants of bank interest margins in sub-Saharan Africa (No. 13-34). *International Monetary Fund*, 13-34.
- Akpan, N. (2007). Internal control and bank fraud in Nigeria. *Economic Journal*, 95, 118-132.
- Alexander, K. (2006). Corporate governance and banks: The role of regulation in reducing the principal-agent problem. *Journal of Banking Regulation*, 7(1), 17-40.
- Allen, L. (1988). The determinants of bank interest margins: a note. *Journal of Financial and Quantitative analysis*, 23(02), 231-235.
- Alonso-Bonis, S., & de Andrés-Alonso, P. (2007). Ownership structure and performance in large Spanish companies. Empirical evidence in the context of an endogenous relation. *Corporate ownership and control*, 4(4), 206-216.
- Amidu, M., & Wolfe, S. (2013). The impact of market power and funding strategy on bank-interest margins. *The European Journal of Finance*, 19(9), 888-908.
- Angbazo, L. (1997). Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking. *Journal of Banking & Finance*, 21(1), 55-87.
- Arun, T. G., & Turner, J. D. (2004). Corporate Governance of Banks in Developing Economies: concepts and issues. *Corporate Governance: An International Review*, 12(3), 371-377.
- Bailey, D., & Katz, J. N. (2011). Implementing Panel Corrected Standard Errors in R: The PCSE Package. *Journal of Statistical Software*, 42(CS1), 1-11.
- Baltagi, B. H. (2007). Comments on: Panel data analysis—advantages and challenges. *Test*, 16(1), 28-30.
- Banda, C. M. (2011). "The determinants of banking sector interest rate spreads in Zambia."

- Bankscope (2014). Banking database (Bureau Van Dijk-IBCA).
- Barth, J. R., Caprio, G., & Levine, R. (2001). The regulation and supervision of banks around the world: *A new database* (Vol. 2588). World Bank Publications.
- Bawumia, M., Belnye, F., & Ofori, M.E. (2005). The Determinants of Bank Interest Spreads in Ghana: An Empirical Analysis of Panel Data', Bank of Ghana Working Paper WP/BOG-2005/09, Accra.
- Bebchuk, L. A., & Fried, J. M. (2003). *Executive compensation as an agency problem* (No. w9813). National Bureau of Economic Research.
- Beck, N., & Katz, J. N. (1995). What to do (and not to do) with time-series cross-section data. *American political science review*, 89(03), 634-647.
- Beck, T., & Hesse, H. (2006). Bank efficiency, ownership, and market structure: why are interest spreads so high in Uganda? *World Bank Policy Research Working Paper*, (4027).
- Beck, T., & Hesse, H. (2009). Why are interest spreads so high in Uganda? *Journal of Development Economics*, 88(2), 192-204.
- Bektas, E. (2014). Are the determinants of bank net interest margin and spread different? The case of North Cyprus.
- Ben Khediri, K., & Ben-Khedhiri, H. (2009). Determinants of Islamic bank profitability in the Mena region. *International Journal of Monetary Economics and Finance*, 2(3-4), 409-426.
- Ben Selma Mokni, R., & Rachdi, H. (2014). Assessing the bank profitability in the MENA region: A comparative analysis between conventional and Islamic bank. *International Journal of Islamic and Middle Eastern Finance and Management*, 7(3), 305-332.
- Berger, A. N., & Hannan, T. H. (1998). The efficiency cost of market power in the banking industry: A test of the "quiet life" and related hypotheses. *Review of Economics and Statistics*, 80(3), 454-465.
- Berle, A. A. Jr., and Means, G.C. (1932). *The Modern Corporation and private property*, (Macmillan, New York, NY).
- Bikker, J. A., & Van Leuvensteijn, M. (2008). Competition and efficiency in the Dutch life insurance industry. *Journal of Applied Economics*, 40(16), 2063-2084.
- Boyd, J. H., & Smith, B. D. (1992). Intermediation and the equilibrium allocation of investment capital: Implications for economic development. *Journal of Monetary Economics*, 30(3), 409-432.

- Bremus, F. (2013). Cross-Border Banking, Bank Market Structures and Market Power: Theory and Cross-Country Evidence.
- Brock, P. L., & Suarez, L. R. (2000). Understanding the behavior of bank spreads in Latin America. *Journal of development Economics*, 63(1), 113-134.
- Caprio, G., Laeven, L., & Levine, R. (2007). Governance and bank valuation. *Journal of Financial Intermediation*, 16(4), 584-617.
- Carbó, S., Humphrey, D., Maudos, J., & Molyneux, P. (2009). Cross-country comparisons of competition and pricing power in European banking. *Journal of International Money and Finance*, 28(1), 115-134.
- Castañeda, J. C. (2001). Competing monies in Guatemala: what should we expect?
- Chen, S. H., & Liao, C. C. (2011). Are foreign banks more profitable than domestic banks? Home-and host-country effects of banking market structure, governance, and supervision. *Journal of Banking & Finance*, 35(4), 819-839.
- Chernykh, L., & Theodosiou, A. K. (2011). "Determinants of bank long-term lending behavior: Evidence from Russia." *Multinational Finance Journal*, 15.3/4, 93-216.
- Chirwa, E. W., & Mlachila, M. (2004). Financial reforms and interest rate spreads in the commercial banking system in Malawi. *IMF Staff papers*, 96-122.
- Chowdhury, M. S., & Ahmad, N. (2012). Factors Affecting Consumer Participation in Online Shopping In Malaysia: The Case of University Students. *European Journal of Business and Economics*, 5.
- Cihák, M., & Podpiera, R. (2005). Bank behavior in developing countries: Evidence from East Africa (No. 2005-2129). International Monetary Fund.
- Claessens, S., Demirgüç-Kunt, A., & Huizinga, H. (2001). How does foreign entry affect domestic banking markets? *Journal of Banking & Finance*, 25(5), 891-911.
- Claus, I., & Grimes, A. (2003). Asymmetric information, financial intermediation and the monetary transmission mechanism: *A critical review* (No. 03/19). New Zealand Treasury.
- Coffee, J. C. (1991). Liquidity versus control: The institutional investor as corporate monitor. *Columbia Law Review*, 1277-1368.
- Cornett, M. M., Guo, L., Khaksari, S., & Tehranian, H. (2010). The impact of state ownership on performance differences in privately-owned versus state-owned banks: An international comparison. *Journal of Financial Intermediation*, 19 (1), 74-94.
- Crowley, J. (2007). Interest rate spreads in English-speaking African countries. *IMF Working Papers*, 1-34.

- Crutchley, C. E., Jensen, M. R., Jahera, J. S., & Raymond, J. E. (1999). Agency problems and the simultaneity of financial decision making: The role of institutional ownership. *International review of financial analysis*, 8(2), 177-197.
- Davidson, R. MacKinnon, JG (1993). Estimation and Inference in Econometrics.
- De Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of the board of directors. *Journal of banking & finance*, 32(12), 2570-2580.
- Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 13(2), 379-408.
- Demirgüç-Kunt, A., Huizinga, H., & Claessens, S. (1998). How does foreign entry affect the domestic banking market? *World Bank Policy Research Working Paper*, (1918).
- Dempsey, S. J., & Laber, G. (1992). Effects of agency and transaction costs on dividend payout ratios: further evidence of the agency-transaction cost hypothesis. *Journal of Financial research*, 15(4), 317-321.
- Demsetz, H. (1983). Structure of Ownership and the Theory of the Firm, The. *JL & Econ.*, 26, 375.
- Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *The Journal of Political Economy*, 1155-1177.
- Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*, 21(3), 307-327.
- Dietrich, A., & Wanzenried, G. (2014). The determinants of commercial banking profitability in low-, middle-, and high-income countries. *The Quarterly Review of Economics and Finance*, 54(3), 337-354.
- Drakos, K. (2002). The Dealership model for interest margins: The case of the Greek banking industry. *Journal of Emerging Market Finance*, 1(1), 75-98.
- Easterbrook, F. H. (1984). Two agency-cost explanations of dividends. *The American Economic Review*, 650-659
- Easterbrook, F., & Fischel, D. (1991). The economic structure of company law. Cambridge, MA: Harvard University Press.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of management review*, 14(1), 57-74.
- Eita, J. H. (2012). Explaining Interest Rate Spread in Namibia. *International Business & Economics Research Journal (IBER)*, 11(10), 1123-1132.

- Fama, E. F. (1980). Agency Problems and the Theory of the Firm. *The journal of political economy*, 288-307.
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of law and economics*, 301-325.
- Folawewo, A. O., & Tennant, D. (2008). Determinants of interest rate spreads in Sub-Saharan African Countries: A dynamic panel Analysis. A paper prepared for the 13th Annual African Econometrics Society Conference, 9 – 11 July, 2008, Pretoria, Republic of South Africa, 26.
- Friend, I., & Lang, L. H. (1988). An empirical test of the impact of managerial self-interest on corporate capital structure. *Journal of finance*, 271-281.
- Fry, M. J. (1995). Financial development in Asia: some analytical issues. *Asian - Pacific Economic Literature*, 9(1), 40-57.
- Fungáčová, Z., & Poghosyan, T. (2011). Determinants of bank interest margins in Russia: Does bank ownership matter? *Economic systems*, 35(4), 481-495.
- Garr, D. K., & Kyereboah-Coleman, A. (2013). Macroeconomic and Industry Determinants of Interest Rate Spread-Empirical Evidence. *Developing Country Studies*, 3(12), 90-99
- Garza-García, J. G. (2010). What influences net interest rate margins? Developed versus developing countries. *Banks and Bank Systems*, 5 (4), 32-41.
- Gelos, G. (2006). Banking Spreads in Latin America.
- Gounder, N., & Sharma, P. (2012). Determinants of bank net interest margins in Fiji, a small island developing state. *Applied Financial Economics*, 22(19), 1647-1654.
- Gregory, K., & Hambusch, G. (2015). Factors driving risk in the US banking industry: the role of capital, franchise value and lobbying. *International Journal of Managerial Finance*, 11(3).
- Grenade, K. (2007). Determinants of commercial banks interest rate spreads: Some empirical evidence from the Eastern Caribbean Currency Union. *Eastern Caribbean Central Bank (ECCB) working papers*.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 1251-1271.
- Hesse, H. (2007). *Financial intermediation in the pre-consolidated banking sector in Nigeria* (Vol. 4267). World Bank Publications.
- Hirshleifer, D., & Thakor, A. V. (1992). Managerial conservatism, project choice, and debt. *Review of Financial Studies*, 5(3), 437-470.

- Ho, T. S., & Saunders, A. (1981). The determinants of bank interest margins: theory and empirical evidence. *Journal of Financial and Quantitative analysis*, 16(04), 581-600.
- Honohan, P. (2003). The accidental tax: Inflation and the financial sector. *Unpublished manuscript, The World Bank*.
- Horvath, R. (2009). The determinants of the interest rate margins of Czech banks. *Czech Journal of Economics and Finance (Finance)*, 59(2), 128-136.
- Hsiao, C. (2007). Panel data analysis—advantages and challenges. Cambridge University Press, New York. *Test*, 16(1), 1-22.
- <http://www.investopedia.com/terms/c/capitaladequacyratio.asp>
- Irungu, P. N. (2013). The Effect of Interest Rate Spread on Financial Performance of Commercial Banks in Kenya (*Doctoral dissertation*).
- Jensen, G. R., Solberg, D. P., & Zorn, T. S. (1992). Simultaneous determination of insider ownership, debt, and dividend policies. *Journal of Financial and Quantitative analysis*, 27(02), 247-263.
- Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. Corporate Finance, and Takeovers. *American Economic Review*, 76(2).
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
- Jensen, M. C., & Smith, C. W. (2000). Stockholder, manager, and creditor interests: applications of agency theory. *Theory of the Firm*, 1(1).
- John, K., & Senbet, L. W. (1998). Corporate governance and board effectiveness. *Journal of Banking & Finance*, 22(4), 371-403.
- Jorgensen, O. H., & Apostolou, A. (2013). Brazil's bank spread in international context: from macro to micro drivers. *World Bank Policy Research Working Paper*, (6611).
- Kasman, A., Tunc, G., Vardar, G., & Okan, B. (2010). Consolidation and commercial bank net interest margins: Evidence from the old and new European Union members and candidate countries. *Economic Modelling*, 27(3), 648-655.
- Keenan, J. (2004). Corporate governance in UK/USA boardrooms, *Corporate Governance: An International Review*, 12(2), 172-176.
- Kiguel, M. A., & Okseniuk, J. (2006). Documento de Trabajo N° 11 El Costo del Crédito Bancario.
- Kiptui, M. C. (2014). Determinants of Interest Rate Spread: Some Empirical Evidence from Kenya's Banking Sector. *International Business Research*, 7 (11), 94.

- Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance*, 34(3), 146-159.
- Kumari, S. S. M. (2014). Determinants of Interest Margins of Banks in Sri Lanka. *South Asia Economic Journal*, 15(2), 265-280.
- 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.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *Journal of finance*, 1131-1150.
- Laeven, L., & Majnoni, G. (2005). Does judicial efficiency lower the cost of credit? *Journal of Banking & Finance*, 29(7), 1791-1812.
- Laryea, S., Agyepong, S. A., Leiringer, R., & Hughes, W. (2012). West Africa Built Environment Research (Waber) Conference 24-26 July 2012 Abuja, Nigeria.
- Lawrence, J., & Stapledon, G. (1999). Do independent directors add value? Melbourne: Centre for Corporate Law and Securities Regulation, University of Melbourne.
- Li, H., Jahera Jr, J. S., & Yost, K. (2013). Corporate risk and corporate governance: another view. *Managerial Finance*, 39(3), 204-227.
- López-Espinosa, G., Moreno, A., & de Gracia, F. P. (2011). Banks' net interest margin in the 2000s: A macro-accounting international perspective. *Journal of International Money and Finance*, 30(6), 1214-1233.
- Martinez, P. M. and Mody, A. (2004). How foreign participation and market concentration impact bank spreads: evidence from Latin America, *Journal of Money, Credit and Banking*, 36, 511–537.
- Maudos, J., & De Guevara, J. F. (2004). Factors explaining the interest margin in the banking sectors of the European Union. *Journal of Banking & Finance*, 28(9), 2259-2281.
- Maudos, J., & Solís, L. (2009). The determinants of net interest income in the Mexican banking system: An integrated model. *Journal of Banking & Finance*, 33(10), 1920-1931.
- Mensah, S., & Abor, J. Y. (2014). Agency Conflict and Bank Interest Spreads in Ghana. *African Development Review*, 26(4), 549-560.
- Mercado-Mendez, J., & Willey, T. (1995). Agency costs in the banking industry: An examination of ownership behavior, leverage and dividend policies. *Journal of Economics and Finance*, 19(3), 105-117.

- Micco, A., Panizza, U., & Yanez, M. (2007). Bank ownership and performance. Does politics matter? *Journal of Banking & Finance*, 31(1), 219-241.
- Mohan, R. (2004, March). A Decade of Reforms in Government Securities Market in India and the Road Ahead. In *speech delivered at the FIMMDA-PDAI conference, Dubai, RBI Bulletin*.
- Murphy, K. J. (2012). Executive compensation: Where we are, and how we got there. *Handbook of the Economics of Finance*. Elsevier Science North Holland (Forthcoming).
- Mustapha, M. Z. (2012). Determinants of Executive Directors' remuneration among Malaysian Public Listed Companies (*Doctoral Dissertation*, Cardiff University).
- Myers, S. (1997). A Determinants of Corporate Borrowing, *Journal of Financial Economics*, 5, 147-175.
- Nampewo, D. (2013). What drives interest rate spreads in Uganda's Banking Sector. *International Journal of Economic Finance*, 5(1), 76-85
- Ndungu, N., & Ngugi, R. W. (2000). Banking Sector Interest Rate Spreads in Kenya, KIPPRA Discussion Paper No. 5. *Kenya Institute for Public Policy Research and Analysis (KIPPRA)*, Nairobi.
- Ngugi, R. W. (2001). An empirical analysis of interest rate spread in Kenya. Nairobi: African Economic Research Consortium, Research Paper 106.
- Obamuyi, T. M. (2013). Determinants of Banks' Profitability in a Developing Economy: Evidence from Nigeria. *Organizations and markets in emerging economies*, (2), 97-111.
- Pagano, M. (1993). The flotation of companies on the stock market: A coordination failure model. *European Economic Review*, 37(5), 1101-1125.
- Plakalović, N., & Alihodzic, A. A. (2015). Determinants of the Net Interest Margins in BH Banks. *Industrija*, 43(1).
- Poghosyan, T. (2010). Re-examining the impact of foreign bank participation on interest margins in emerging markets. *Emerging markets review*, 11(4), 390-403.
- Poghosyan, T. (2012). Financial Intermediation Costs in Low-Income Countries: The Role of Regulatory, Institutional, and Macroeconomic Factors. IMF Working Paper, WP/12/140
- Porta, R., Lopez - de - Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The journal of finance*, 54(2), 471-517.
- Quaden, G. (2004). Efficiency and stability in an evolving financial system. In *Speech at the National Bank of Belgium Conference*.

- Randall, M. R. (1998). *Interest rate spreads in the Eastern Caribbean*. International Monetary Fund.
- Reed, W. R., & Webb, R. (2010). The PCSE Estimator is Good--Just Not As Good As You Think. *Journal of Time Series Econometrics*, 2(1).
- Robinson, J. W. (2002). *Commercial Bank Interest Rate Spreads in Jamaica: Measurement, Trend and Prospects*. Kingston: Bank of Jamaica.
- Rodrik, D. (2005). Growth strategies. *Handbook of economic growth*, 1, 967-1014
- Ross, S. A. (1973). The economic theory of agency: The principal's problem. *The American Economic Review*, 134-139.
- Rozeff, M. S. (1982). Growth, beta and agency costs as determinants of dividend payout ratios. *Journal of financial Research*, 5(3), 249-259.
- Saka, A. N. A., Aboagye, A. Q., & Gemegah, A. (2012). Technical Efficiency of the Ghanaian Banking Industry and the Effects of the Entry of Foreign Banks. *Journal of African Business*, 13(3), 232-243.
- Sapienza, P. (2004). The effects of government ownership on bank lending. *Journal of financial economics*, 72(2), 357-384.
- Saunders, A., & Schumacher, L. (2000). The determinants of bank interest rate margins: an international study. *Journal of international money and finance*, 19(6), 813-832.
- Shin, S. O., Min, H. G., & McDonald, J. A. (2014). The Market-Discipline Effects of Subordinated Debt: Enhanced US Commercial Banking-Sector Efficiency and Stability. *Journal of Financial Risk Management*, 3(03), 78.
- Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *The Journal of Political Economy*, 461-488.
- Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The journal of finance*, 52(2), 737-783.
- Siddiqui, M. A. (2012). Towards determination of interest spread of commercial banks: Empirical evidences from Pakistan. *African Journal of Business Management*, 6(5), 1851-1862.
- Stata Corp, L. P. (2005). *Stata base reference manual* (Vol. 2).
- Tennant, D., & Folawewo, A. (2009). Macroeconomic and market determinants of interest rate spreads in low-and middle-income countries. *Applied Financial Economics*, 19(6), 489-507.

- Tsorhe, J. S., Aboagye, A. Q., & Kyereboah-Coleman, A. (2011). Corporate governance and bank risk management in Ghana.
- Unite, A. A., & Sullivan, M. J. (2003). The effect of foreign entry and ownership structure on the Philippine domestic banking market. *Journal of Banking & Finance*, 27(12), 2323-2345.
- Uwuigbe, O. R. (2011). Corporate governance and financial performance of banks: a study of listed banks in Nigeria (*Doctoral dissertation*, Covenant University).
- Uzun, H., Szewczyk, S. H., & Varma, R. (2004). Board composition and corporate fraud. *Financial Analysts Journal*, 60(3), 33-43.
- Valverde, S. C., & Fernández, F. R. (2007). The determinants of bank margins in European banking. *Journal of Banking & Finance*, 31(7), 2043-2063.
- Valverde, S. C., Del Paso, R. L., & Fernandez, F. R. (2004). *Banks, financial innovations and regional growth*. UN University, Institute for New Technologies.
- Vanderstappen, T. Does Team Management pay off in Family Businesses?
- Vins, O., & Bloch, T. (2008). *The effects of size on local banks' funding costs* (No. 189). Working paper series//Johann-Wolfgang-Goes the-Universität Frankfurt am Main, Fachbereich Wirtschaftswissenschaften Finance & accounting.
- Were, M., & Wampua, J. (2012). What Factors Drive Interest Rate Spread of Commercial Banks? Empirical Evidence from Kenya. *Review of Development Finance*, 4, 73-82.
- Williams, B. (2007). Factors determining net interest margins in Australia: domestic and foreign banks. *Financial Markets, Institutions & Instruments*, 16(3), 145-165.
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Massachusetts.
- World Development Indicators (2014). World Bank, Washington DC.
- You, V. (2014). The linkage between bank net interest margins and non-interest income: The case of the Cambodian Banking industry. University Library of Munich, Germany.

## APPENDIX

VARIABLE	SPREAD1				SPREAD2			
	COEFF.	STD.ERR	Z	P> Z	COEFF.	STD.ERR	Z	P> Z
EMOLUM	0.1233787	0.065782	1.88	0.061*	0.233198	0.089692	2.6	0.009***
BCOMPP	0.0259976	0.007022	3.7	0.000***	0.046615	0.007117	6.55	0.000***
F	0.0008049	0.002627	0.31	0.759	0.012981	0.003343	3.88	0.000***
MGT	0.039049	0.005837	6.69	0.000***	0.060815	0.006341	9.59	0.000***
LLP	0.0336868	0.020026	1.68	0.093*	-0.05795	0.016981	-3.41	0.001***
SIZE	0.0007361	0.000699	1.05	0.292	-0.00016	0.000586	-0.27	0.784
INFL	0.0413707	0.010374	3.99	0.000***	0.074211	0.012751	5.82	0.000***
INTVOL	0.0786868	0.021418	3.67	0.000***	0.092616	0.049227	1.88	0.06*
EXCH	0.0000119	2.69E-06	4.42	0.000***	-1.04E-06	2.00E-06	-0.52	0.604
BRES	0.014956	0.008361	1.79	0.074*	0.011945	0.00723	1.65	0.098*
RSKAVER	.0941274	0.01776	5.3	0.000***	0.016416	0.012341	1.6	0.109
HHI	-0.005329	0.005362	-0.99	0.32	-0.17849	0.006036	-2.96	0.003***
RSQ.	0.7721				0.831			
Waldchi2	3768				4376			
PROB>CHI2	0.0000				0.0000			
D.O.F	11,766				11,767			

Source: bank scope, central banks, WDI and own computation. Where \*, \*\* and \*\*\* represent 10%, 5% and 1% significant levels respectively. D.O.F is degree of freedom.

**Regression Results for the Blocks (North, Central and South Africa) respectively**

VARIABLE	SPREAD1				SPREAD2			
	Coeff.	Std .Err.	Z	P> Z	Coeff.	Std. Err.	Z	P> Z
<b>EMOLUM</b>	-.2811547	0.1717295	-1.64	0.102	.4901463	0.234784	2.09	0.037**
<b>BCOMPP</b>	.0272875	0.011158	2.45	0.014**	.0172219	0.012567	1.37	0.171
<b>F</b>	-.0014767	0.0031641	-0.47	0.641	.0047529	0.00423	1.12	0.261
<b>MGT</b>	.016765	0.0088223	1.9	0.057*	.0559227	0.010157	5.51	0.000***
<b>LLP</b>	.0667812	0.0321488	2.08	0.038**	-.0200599	0.032974	-0.61	0.543
<b>SIZE</b>	0.00623	0.0011431	6.04	0.000***	.008566	0.001399	6.12	0.000***
<b>INFL</b>	.0250901	0.0124914	2.01	0.045**	.0639682	0.019002	3.37	0.001***
<b>INTVOL</b>	.1059426	0.0266859	3.97	0.000***	.1509838	0.058462	2.58	0.01***
<b>EXCH</b>	.0000146	0.0000338	4.31	0.000***	-4.77e-06	1.99E-05	-2.39	0.017**
<b>BRES</b>	-.0084095	0.0113352	-0.74	0.458	.0682814	0.016779	4.07	0.000***
<b>RSKAVER</b>	.1249056	0.026644	4.69	0.000***	-.002105	0.020888	-0.1	0.92
<b>HHI</b>	-.0519395	0.0096031	-5.41	0.000***	-.1244799	0.014974	-8.31	0.000***
<b>RSQ</b>	0.8703				0.9185			
<b>WALDCHI2</b>	2853.95				4574			

Variable	spread1				spread2			
	Coeff.	Std.err	Z	P> Z	Coeff.	Std.err	Z	P> Z
Emolum	-.2811547	0.1717295	-1.64	0.102	.4901463	0.234784	2.09	0.037**
Bcomp	.0272875	0.011158	2.45	0.014**	.0172219	0.012567	1.37	0.171
F	-.0014767	0.0031641	-0.47	0.641	.0047529	0.00423	1.12	0.261
Mgt	.016765	0.0088223	1.9	0.057*	.0559227	0.010157	5.51	0.0000***
Llp	.0667812	0.0321488	2.08	0.038**	-.0200599	0.032974	-0.61	0.543
Size	0.00623	0.0011431	6.04	0.000***	.008566	0.001399	6.12	0.0000***
Infl	.0250901	0.0124914	2.01	0.045**	.0639682	0.019002	3.37	0.001***
Intvol	.1059426	0.0266859	3.97	0.0000***	.1509838	0.058462	2.58	0.01***

Exch	.0000146	0.0000338	4.31	0.0000***	-4.77e-06	1.99E-05	-2.39	0.017**
Bres	-.0084095	0.0113352	-0.74	0.458	.0682814	0.016779	4.07	0.0000***
Rskaver	.1249056	0.026644	4.69	0.0000***	-.002105	0.020888	-0.1	0.92
HHI	-.0519395	0.0096031	-5.41	0.0000***	-.1244799	0.014974	-8.31	0.0000***
RSQ.	0.8703				0.9185			
Waldchi2	2853.95				4574			

Variable	Spread1				spread2			
	Coeff.	Std.err	Z	P> Z	Coeff.	Std.err	Z	P> Z
Emolum	0.183562	0.0960963	1.91	0.056*	0.404679	0.098218	4.12	0.0000***
Bcomp	0.04543	0.0123865	3.67	0.0000***	0.056474	0.009695	5.82	0.0000***
F	0.005191	0.0042612	1.22	0.223	0.011705	0.002849	4.11	0.0000***
Mgt	0.021618	0.0093708	2.31	0.021**	0.014374	0.006145	2.34	0.019**
Llp	0.188504	0.0531948	3.54	0.0000***	0.065909	0.02532	2.6	0.009***
Size	-0.001161	0.0012108	-0.96	0.338	-0.00198	0.000734	-2.69	0.007***
Infl	0.131832	0.032628	4.04	0.0000***	0.167857	0.024783	6.77	0.0000***
Exch	-0.000006	0.00000405	-1.45	0.148	3.15E-06	3.04E-06	1.04	0.299
Intvol	-0.017037	0.0404846	-0.42	0.674	-0.16239	0.039463	-4.11	0.0000***
Bres	0.0343581	0.0117262	2.93	0.003***	-0.00044	0.006524	-0.07	0.946
Rskaver	0.0277887	0.0235222	1.18	0.237	-0.03565	0.008863	-4.02	0.0000***
HHI	-0.013376	0.0086541	-1.55	0.122	0.004471	0.004471	0.54	0.586
RSQ.	0.7535				0.8786			
Waldchi2	2319.37				3816.57			

**Africa Tests Results**

Hausman test results for spread1

$$\text{chi2 (10)} = (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) = 32.37$$

$$\text{Prob}>\text{chi2} = 0.0003$$

Hausman test results for spread2

$$\text{chi2 (10)} = (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) = 49.99,$$

$$\text{Prob}>\text{chi2} = 0.0000$$

Shapiro-Wilk W test for normal data for spread1

<b>OBS.</b>	<b>W</b>	<b>V</b>	<b>Z</b>	<b>PROB&gt;Z</b>
<b>960</b>	0.97897	12.777	6.298	0.00000

Shapiro-Wilk W test for normal data for spread2

<b>OBS.</b>	<b>W</b>	<b>V</b>	<b>Z</b>	<b>PROB&gt;Z</b>
<b>960</b>	0.99739	1.583	1.136	0.12795

Wooldridge test for autocorrelation in panel data for spread1

$$F(1, 169) = 50.642, \text{ Prob} > F = 0.0000$$

Wooldridge test for autocorrelation in panel data for spread2

$$F(1, 169) = 93.395, \text{ Prob} > F = 0.0000$$

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread1

$$H_0: \sigma(i)^2 = \sigma^2 \text{ for all } i \text{ chi2 (182)} = 1.6e+31, \text{ Prob}>\text{chi2} = 0.0000$$

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread2

$$H_0: \sigma(i)^2 = \sigma^2 \text{ for all } i \text{ chi2 (182)} = 1.5e+32, \text{ Prob}>\text{chi2} = 0.0000$$

Skewness/Kurtosis tests for Normality for spread1

<b>OBS.</b>	<b>PR(SKEWNESS)</b>	<b>PR(KURTOSIS)</b>	<b>ADJCHI2(2)</b>	<b>PROB&gt;CHI2</b>
<b>960</b>	0.2842	0.0000	20.41	0.0000

Skewness/Kurtosis tests for Normality for spread2

<b>OBS.</b>	<b>PR(SKEWNESS)</b>	<b>PR(KURTOSIS)</b>	<b>ADJCHI2(2)</b>	<b>PROB&gt;CHI2</b>
<b>960</b>	0.6317	0.8445	0.27	0.8745

### North African Countries Tests Results

Hausman test results for spread1

$$\text{chi2 (11)} = (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}] (\mathbf{b}-\mathbf{B}) = 41.22$$

$$\text{Prob}>\text{chi2} = 0.0000$$

Hausman test results for spread2

$$\text{Chi2 (11)} = (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}] (\mathbf{b}-\mathbf{B}) = 534.34, \text{Prob}>\text{chi2} = 0.0000$$

Shapiro-Wilk W test for normal data for spread1

<b>OBS.</b>	<b>W</b>	<b>V</b>	<b>Z</b>	<b>PROB&gt;Z</b>
<b>162</b>	0.70340	36.869	8.211	0.00000

Shapiro-Wilk W test for normal data for spread2

<b>OBS.</b>	<b>W</b>	<b>V</b>	<b>Z</b>	<b>PROB&gt;Z</b>
<b>162</b>	0.97884	2.630	2.201	0.0138

Wooldridge test for autocorrelation in panel data for spread1

H0: no first order autocorrelation

$$F(1, 28) = 0.743, \quad \text{Prob} > F = 0.3960$$

Wooldridge test for autocorrelation in panel data for spread2

H0: no first order autocorrelation

$$F(1, 28) = 23.848, \quad \text{Prob} > F = 0.0000$$

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread2

$$\text{H0: } \sigma^2(i) = \sigma^2 \text{ for all } I, \text{ chi2 (29)} = 282.63, \text{Prob}>\text{chi2} = 0.0000$$

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread1

H0:  $\sigma_i^2 = \sigma^2$  for all i  $\chi^2(29) = 4496.35$ , Prob> $\chi^2 = 0.0000$

### Central African Countries Tests Results

Hausman test results for spread1

Ho: difference in coefficients not systematic

$\chi^2(10) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 37.01$ , Prob> $\chi^2 = 0.0001$

Hausman test results for spread2

Ho: difference in coefficients not systematic

$\chi^2(10) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 64.45$ , Prob> $\chi^2 = 0.0000$

Shapiro-Wilk W test for normal data for spread1

OBS.	W	V	Z	PROB.>Z
367	0.97354	6.744	4.523	0.00000

Shapiro-Wilk W test for normal data for spread2

OBS.	W	V	Z	PROB.>Z
367	0.95388	11.756	5.840	0.00000

Skewness/Kurtosis tests for Normality for spread1

OBS.	PR(SKEWNESS)	PR(KURTOSIS)	ADJCHI2(2)	PROB>CHI2
367	0.0002	0.0002	22.43	0.0000

Skewness/Kurtosis tests for Normality for spread2

OBS.	PR(SKEWNESS)	PR(KURTOSIS)	ADJCHI2(2)	PROB>CHI2
367	0.0000	0.0022	35.04	0.0000

Wooldridge test for autocorrelation in panel data for spread1

H0: no first order autocorrelation

$F(1, 66) = 27.323$ , Prob > F = 0.0000

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread1

H0:  $\sigma_i^2 = \sigma^2$  for all i  $\chi^2(75) = 6.6e+30$ , Prob> $\chi^2 = 0.0000$

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread2

H0:  $\sigma_i^2 = \sigma^2$  for all i  $\chi^2(75) = 3.9e+31$ , Prob> $\chi^2 = 0.0000$

Wooldridge test for autocorrelation in panel data for spread2

H0: no first order autocorrelation

F(1, 66) = 119.808, Prob > F = 0.0000

### **South African Countries Tests Results**

Hausman test results for spread1

Ho: difference in coefficients not systematic

$\chi^2(10) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 30.37$ , Prob> $\chi^2 = 0.0007$

Hausman test results for spread2

Ho: difference in coefficients not systematic

$\chi^2(10) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 109.29$ , Prob> $\chi^2 = 0.0000$

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread2

H0:  $\sigma_i^2 = \sigma^2$  for all i  $\chi^2(78) = 6.6e+30$ , Prob> $\chi^2 = 0.0000$

Wooldridge test for autocorrelation in panel data for spread2

H0: no first order autocorrelation

F(1, 73) = 84.800, Prob > F = 0.0000

Shapiro-Wilk W test for normal data for spread2

OBS.	W	V	Z	PROB.>Z
431	0.97583	7.114	4.685	0.00000

Skewness/Kurtosis tests for Normality for spread2

OBS.	PR(SKEWNESS)	PR(KURTOSIS)	ADJCHI2(2)	PROB>CHI2
431	0.0010	0.5872	10.12	0.0063

Wooldridge test for autocorrelation in panel data for spread1

H0: no first order autocorrelation

F (1, 73) = 69.217, Prob > F = 0.0000

Modified Wald test for group wise heteroskedasticity in fixed effect regression model for spread1

H0:  $\sigma^2(i) = \sigma^2$  for all i  $\chi^2(78) = 72837.43$ , Prob>chi2 = 0.0000

Shapiro-Wilk W test for normal data for spread1

OBS.	W	V	Z	PROB.>Z
431	0.93466	19.233	7.059	0.00000

Skewness/Kurtosis tests for Normality for spread1

OBS.	PR(SKEWNESS)	PR(KURTOSIS)	ADJCHI2(2)	PROB>CHI2
431	0.0000	0.0049	42.14	0.0000

Report on regression results for Africa when the Agency Costs Was Decomposed Into Audit Cost (Audta) and Directors fees (Demolum)

VARIABLE	Spread1			Spread2		
	Coeff.	Std.err.	P> Z	Coeff.	Std.err.	P> Z
DEMOLUM	0.106191	0.076598	0.166	.018491	.102965	0.857
AUDTA	0.057036	0.141011	0.686	1.01539	.2176618	0.0000
F	0.026474	0.007309	0.000	.0114852	.0032821	0.0000

<b>BCOMPP</b>	0.000274	0.002746	0.921	.0456756	.0074618	0.0000
<b>MGT</b>	0.040525	0.005921	0.0000	.0572814	.006297	0.000
<b>LLP</b>	0.032049	0.019761	0.105	-.0564217	.0164647	0.001
<b>SIZE</b>	0.000628	0.000722	0.384	-.0001773	.0005932	0.765
<b>INFL</b>	0.041144	0.010766	0.0000	.0660067	.0127519	0.000
<b>INTVOL</b>	1.16E-05	2.68E-06	0.0000	.0911278	.0488655	0.062
<b>EXCH</b>	0.080332	0.02158	0.0000	2.63e-07	1.96e-06	0.893
<b>BRES</b>	0.015375	0.008527	0.071	.0116796	.0072222	0.106
<b>RSKAVER</b>	0.093269	0.017923	0.0000	.0079486	.0097104	0.413
<b>HHI</b>	-0.00477	0.005421	0.379	-.0194559	.0063047	0.002
<b>RSQ</b>	0.7695			0.8343		
<b>WALDCHI2</b>	3612.57			4412.74		
<b>D.O.F</b>	(12, 750)			(12, 751)		

**Report on Regression Results for North, Central and South Africa When the Agency Costs Was Decomposed Into Audit Cost (Audta) and Directors Fees (Demolum)**

VARIABLE	Spread1			Spread2		
	Coeff.	Std.err	P> Z	Coeff.	Std.err	P> Z
DEMOLUM	.407907	0.2147267	0.057	0.00586	0.064622	0.928
AUDTA	-.094818	0.3207462	0.768	0.118701	0.180373	0.51
BCOMPP	.0586144	0.0066663	0.000	0.027977	0.007497	0.000
F	.0058045	0.002023	0.004	0.000171	0.002467	0.945
MGT	-.0161763	0.0084128	0.055	0.007272	0.005719	0.203
LLP	-.0731821	0.0117149	0.000	0.025256	0.010352	0.015
SIZE	-.0007603	0.0006749	0.26	0.002695	0.000707	0.000
INFL	.1230445	0.0476471	0.01	0.033753	0.017061	0.048
INTVOL	-.2135671	0.0999302	0.033	0.021532	0.040341	0.594
EXCH	.0001738	0.00000865	0.045	0.000126	5.97E-05	0.035
BRES	.0476418	0.0120855	0.000	0.021421	0.007512	0.004
RSKAVER	-.0050556	0.0277935	0.856	0.03242	0.016856	0.054
HHI	-.1288868	0.033718	0.000	-0.10859	0.045945	0.018
RSQ	0.8929			0.9534		
WALDCHI2	5440000			4754.34		
D.O.F	(11, 116)			(11, 117)		

VARIABLE	Spread1			Spread2		
	Coeff.	Std.err	P> Z	Coeff.	Std.err	P> Z
<b>DEMOLUM</b>	0.115693	0.309773	0.709	0.356164	0.369722	0.335
<b>AUDTA</b>	-0.62815	0.223367	0.005	0.577816	0.338147	0.087
<b>BCOMPP</b>	0.027545	0.011317	0.015	0.016919	0.012467	0.175
<b>F</b>	-0.0015	0.003305	0.65	0.006007	0.004163	0.149
<b>MGT</b>	0.014977	0.008847	0.09	0.057114	0.010143	0.0000

<b>LLP</b>	0.06727	0.031802	0.034	-0.01754	0.033417	0.6
<b>SIZE</b>	0.007509	0.001195	0.000	0.008127	0.001391	0.0000
<b>INFL</b>	0.02357	0.01227	0.055	0.065594	0.019397	0.001
<b>INTVOL</b>	0.104829	0.025942	0.000	0.153447	0.058483	0.009
<b>EXCH</b>	0.000014	3.47E-06	0.000	-4.69E-06	2.02E-06	0.02
<b>BRES</b>	-0.00897	0.011096	0.419	0.069079	0.016911	0.0000
<b>RSKAVER</b>	0.123278	0.026471	0.0000	0.001321	0.021178	0.95
<b>HHI</b>	-0.05292	0.009604	0.0000	-0.12323	0.014837	0.0000
<b>RSQ</b>	0.8736			0.919		
<b>WALDCHI2</b>	0.2829.22			4607.53		
<b>D.O.F</b>	(12, 276)			(12, 276)		

<b>VARIABLE</b>	<b>Spread1</b>			<b>Spread2</b>		
	Coeff.	std.err	p> z	Coeff.	std.err	p> z
<b>DEMOLUM</b>	.1714787	0.1043451	0.1	0.371729	0.110578	0.001
<b>AUDTA</b>	.0103745	0.25751	0.968	0.62281	0.189938	0.001
<b>BCOMPP</b>	.0443546	0.0122272	0.0000	0.056634	0.009719	0.0000
<b>F</b>	.0058915	0.0045365	0.194	0.010396	0.00288	0.0000
<b>MGT</b>	.0213949	0.0096756	0.027	0.013723	0.006152	0.026
<b>LLP</b>	.1843626	0.0540924	0.001	0.064782	0.024889	0.009
<b>SIZE</b>	-.0012375	0.0011292	0.273	-0.00203	0.000752	0.007
<b>INFL</b>	.1383435	0.0336209	0.0000	0.155234	0.024348	0.000
<b>EXCH</b>	-5.85e-06	0.00000436	0.18	4.05E-06	3.03E-06	0.181
<b>INTVOL</b>	-.0188805	0.0410031	0.645	-0.16161	0.037852	0.0000
<b>BRES</b>	.0384216	0.011785	0.001	-3.6E-05	0.006579	0.996
<b>RSKAVER</b>	.0287991	0.0220872	0.192	-0.03759	0.008919	0.0000
<b>HHI</b>	-.0156587	0.0087206	0.073	0.003375	0.004431	0.446

<b>RSQ</b>	0.7401			0.8797		
<b>WALDCHI2</b>	1993.51			3764.85		
<b>D.O.F</b>	(12, 335)			(12, 335)		

Countries included in the Study

<b>NORTH AFRICAN COUNTRIES</b>	<b>CENTRAL AFRICAN COUNTRIES</b>	<b>SOUTH AFRICAN COUNTRIES</b>
MOROCCO	BENIN	SOUTH AFRICA
ALGERIA	BURKINA FASO	SWAZILAND
SUDAN	COTE D, IVOIRE	MOZAMBIQUE
EGYPT	MALI	NAMIBIA
TUNISIA	NIGERIA	MALAWI
	GHANA	ANGOLA
	SENEGAL	MAURITIUS
	CAMEROON	ZAMBIA
	RWANDA	TANZANIA
	SIERRA LEONE	BOTSWANA
	ETHIOPIA	
	UGANDA	
	KENYA	