

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
(COLLEGE OF HUMANITIES AND SOCIAL SCIENCES) SCHOOL OF
BUSINESS**



**USING MULTIPLE LINEAR REGRESSION TO PREDICT BANKS
PERFORMANCE IN THE GHANAIAN ECONOMY**

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in requirement for the degree of**

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CERTIFICATION

This dissertation is the result of my own work. Material from the published or unpublished work of others, which is referred to in the dissertation, is credited to the author in question in text. Research ethics issues have been considered and handled appropriately within the KNUST Graduate School guidelines and procedures.

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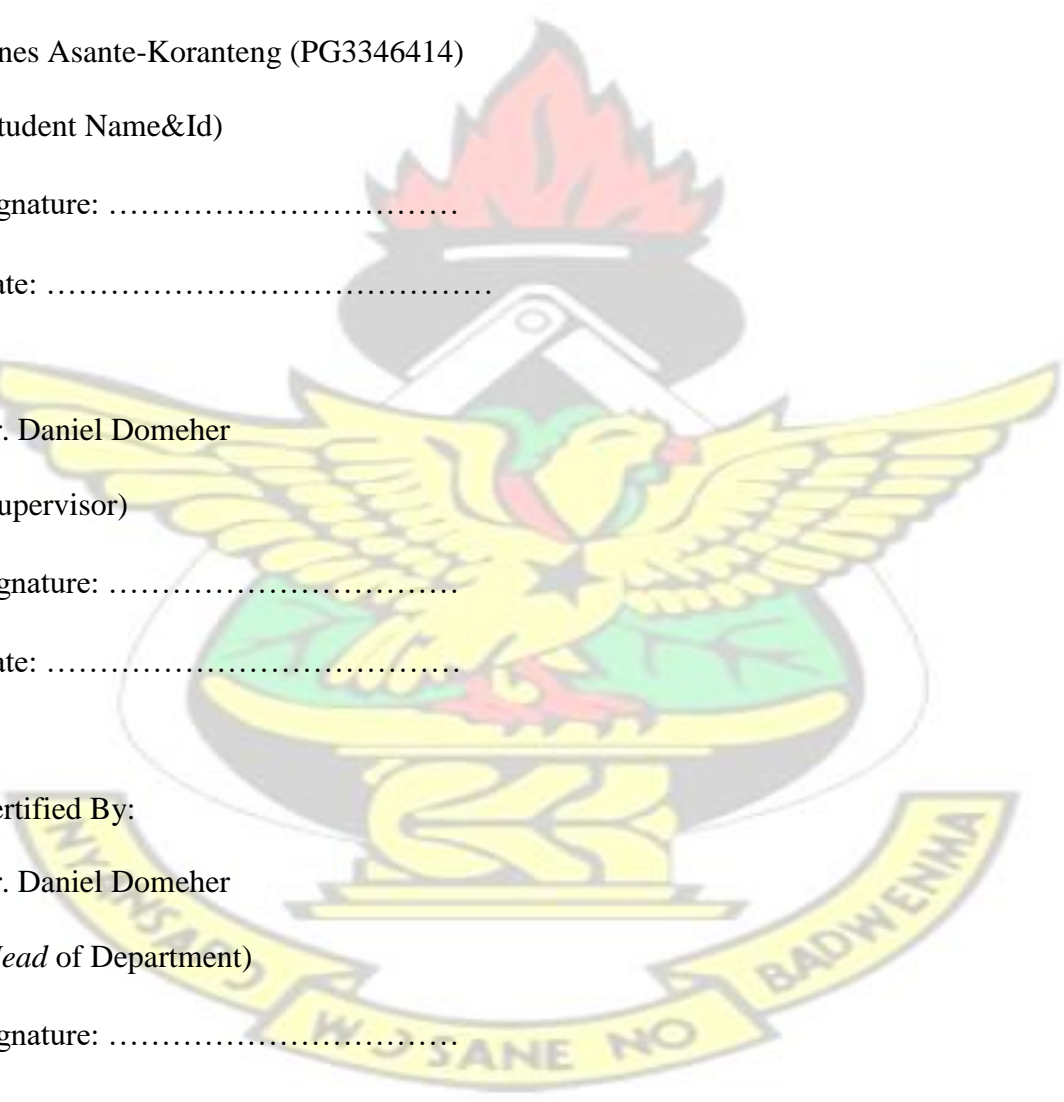
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ABSTRACT

Globalization and technological advancement has created a highly competitive market in the banking and finance industry. The level of offshore banking in both developing and developed countries today is evidence to this fact. Since the financial wheel is critical in any development paradigm, the role of banks is even more critical. Therefore the survival and performance of banks is of much interest not only to policy makers and shareholders, but it is also of interest to researchers too. Performance of the industry depends heavily on the accuracy of the decisions made at managerial level. This study uses multiple linear regression technique in predicting the performance of banks in Ghana. The study then evaluates the performance of the techniques with a goal to find a powerful tool in predicting bank performance. Data of three banks for the period 1991-2015 was used in the study. Return on Asset (ROA) was used as a measure of bank performance, and hence is a dependent variable for the multiple linear regression. Eight variables including LNTA, NII/TA (Log-interest income divided by total assets), NIE/TA (total overhead expenses divided by total assets), LLP/TL (loan loss provisions to total loans), EQUASS (Shareholders' equity as a fraction of total assets) and External determinants: LNGDP (natural log of GDP), MSG (money supply growth rate), and INFL (inflation rate) were used as independent variables. Results from the study reveal that the performance of the Banks has been highly volatile with the banks recording negative profits during some periods within the two decades under study. The study also revealed that non-interest income, non-interest expense, bank's capital strength, natural log of total assets, growth of money supply, and annual rate of inflation are significant key drivers of banks' profitability in Ghana. However, the size of the Ghanaian economy and loan loss provision or provisions for bad debt did not have any significant impact on the banks profitability.

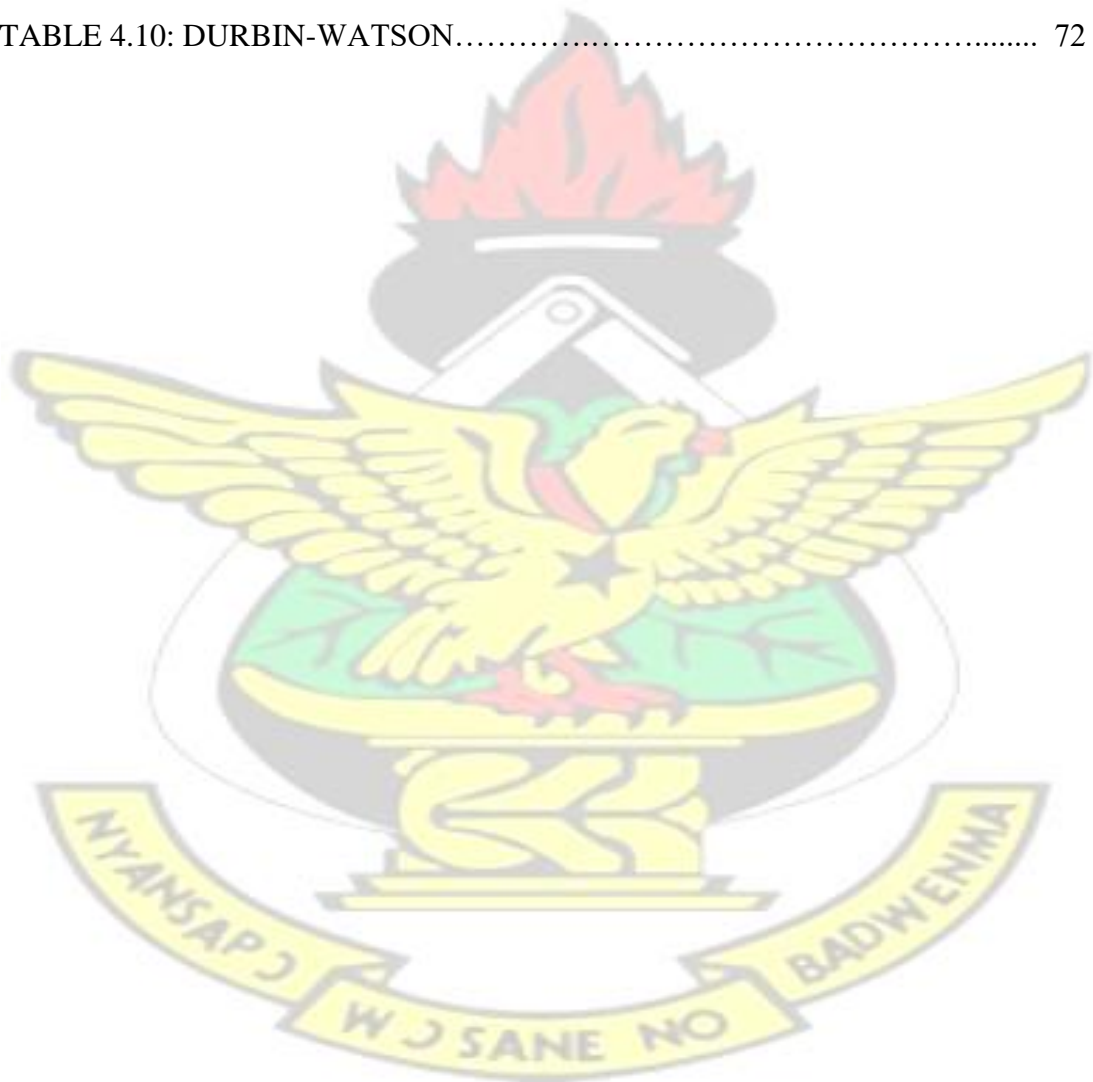
TABLE OF CONTENTS

CERTIFICATION	ii
ABSTRACT	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES.....	vii
LIST OF FIGURES.....	viii
ACKNOWLEDGMENTS	ix
DEDICATION	x
CHAPTER ONE	1
INTRODUCTION	1
1.1 Introduction.....	1
1.2 Background of the Study	4
1.3 Statement of the Problem.....	5
1.4 Aims and Objectives	5
1.5 Research Questions.....	6
1.6 Hypothesis Testing	6
1.7 Scope of the Study	7
1.8 Justification of the Study	7
1.9 Limitations of the Study	8
1.10 Organization of the Study.....	8
CHAPTER TWO	10
LITERATURE REVIEW.....	10
2.1 Introduction	10
2.2 Theoretical Framework.....	11
2.3 A Simple Theoretical Model of Inflation Determination in Ghana.....	17
2.4.0 Trends in Monetary Growth, GDP and Inflation in Ghana.....	19
2.4.1 Post Independence Financial Sector Policies	22
2.4.2 Interest Rate Policy	22
2.4.3 Prudential Regulation and Supervision	23
2.4.4 Financial Sector Adjustment Programme (FINSAP)	24
2.4.5 Restructuring the Public Sector Banks	25
2.4.6 Reforms to the Prudential System.....	29
2.4.7 National Investment Bank (NIB) Limited.....	39
2.4.8 Merchant Bank (Ghana) Limited	40
2.4.9 Ghana Commercial Bank Limited.....	40
2.5 Empirical Literature (Determinant of Bank Profitability)	41
CHAPTER THREE	

RESEARCH METHODOLOGY	46
3.1 Introduction	46
3.2 Sampling or Selection of Banks.....	46
3.3 Data Source	46
3.4 Variables	47
3.4.1 Dependent variable.....	47
3.4.2 Independent variable	47
3.5 Model	48
3.6 Multiple Linear Regression Model	48
3.7 Theoretical Model.....	49
3.8 Justification for the choice of variables.....	50
3.9 Model Diagnosis	53
3.9.1 Multicollinearity Diagnosis	53
3.9.2 Heteroskedasticity Diagnosis	54
3.9.3 Autocorrelation Diagnosis	54
3.9.4 Empirical Model.....	55
3.9.5 Test for Multicollinearity.....	57
3.9.6 Test for Heteroskedasticity	57
3.9.7 Test for Autocorrelation.....	58
CHAPTER FOUR	59
ANALYSIS AND DISCUSSION OF RESULTS.....	59
4.1 Introduction	59
4.2 Regression Analysis	59
4.3 Empirical Models	62
4.4 Model Diagnosis	69
4.5 Multicollinearity Diagnosis	69
4.6 Heteroskedasticity.....	75
4.7 Autocorrelation	76
CHAPTER FIVE.....	78
FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.....	78
5.1 Introduction	78
5.2 Findings.....	78
5.3 Conclusions	78
5.4 Policy Recommendations	79
REFERENCES	81
Glossary Of Key Financial Terms, Equations And Ratios	88

LIST OF TABLES

TABLE 2.1: GDP, MONETARY GROWTH AND INFLATION IN GHANA...34 1991-2015.ANNUAL PERCENTAGECHANGES	34
TABLE 4.1: ANOVA.....	56
TABLE 4.5: GENERAL EMPIRICAL MODEL..... (BOTH ENDOGENOUS AND EXOGENOUS)	57
TABLE 4.6: SEPARATE EMPIRICAL MODEL.....	59
TABLE 4.6: CORRELATION MATRIX I.....	66
TABLE 4.7: VARIABLE INFLATION FACTOR (VIF).....	69
TABLE 4.8: CORRELATION MATRIX II.....	70
TABLE 4.9: BREUSCH-PAGAN/COOK-WEISBERG TEST.....	71
TABLE 4.10: DURBIN-WATSON.....	72



LIST OF FIGURES

FIGURE 2.1: TREND OF THE SELECTED BANKS FROM 1991-2015..... 33

FIGURE 2.2:RELATION BETWEEN GDP,M2+ AND INFLATION.....35

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DEDICATION

I wholeheartedly dedicate this work to God for his support throughout my studies

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

One of the best ways to really understand financial results and what's possible in the way of improvement in your business is to look at what drives results. Knowing the basic drivers and sub-drivers of each component of cash flow and having good visibility into those metrics helps ensure you make smart decisions as you grow your business. Campbell, (2010)

Performance of the banking and finance industry plays a significant role in determining financial stability of any country. Globalization and technological progression have created a highly competitive market in the banking industry.

This affects all organization regardless of business emphasis. Banks are no exception. They have to compete not only with local banks, but also with foreign banks. This situation requires the need for decision makers in the industry to be able to make an accurate decision.

Mathematical and statistical tools can assist decision makers to be able to make accurate predictions and face challenges ahead. The banking sector is the engine of the Ghanaian economy and plays an important financial intermediary role; its health is very critical to the health of the general economy at large.

The economy of Ghana witnessed a decline in the late 1970s and the early part of 1980s (Anim 2000). The negative performance of the economy significantly affected the banking sector. The banking sector became less competitive and most banks were financially weak, unprofitable, and illiquid and technologically bankrupt (Anim 2000).

The then Government of Ghana launched the Economic Recovery Programme (ERP) in April 1983 with the main aim of liberalizing the economy from controls in order to enhance productivity. The economy stabilized between 1984-1986 (Anim 2000). It was, however, felt that for the programme to achieve the desired results there should be a dynamic financial sector to facilitate the payment system and enhance the allocation of resources. Financial Sector Adjustment Programme (FINSAP) was embarked upon in 1988 to address the weakness in the banking industry, which was experiencing low competition, weak financials, and low profitability as a result of high non-performing loan assets, less liquidity, low capital base, and low level of technology (Anim 2000).

Banks in Ghana have therefore undergone restructuring during 1988-92. There have been some improvements in the restructuring in the banking industry. Capital adequacy ratios have seen expansion outpace the statutory requirement of 10%. In real terms bad debts have been falling and the problems of non-performing assets seems to have been tackled.

The banking sector and the growth of the economy, Rajan and Zingales, 1998; Levine, 1998) also explain the underlying factors that influence the financial sector's profitability is therefore essential not only for the managers of the banks, but also for numerous stakeholders such as central banks, bankers association, governments and other financial authorities. Knowledge of these factors would be useful in helping the regulatory authorities and bank managers to create future policies aimed at improving the profitability of the Ghanaian banking sector.

Since the era of the new millennium, Ghana has experienced some great levels of macroeconomic stability. For this reason banks are in a position to efficiently play their

primary role as financial intermediaries in the economic growth process, channelling funds from savers to borrowers for investment. As financial intermediaries, banks play a significant role in the operation of an economy. In Ghana, banks are key providers of funds, and their stability is of paramount importance. Determinants of their profitability and the drivers of bank profitability, for that matter, are essential and crucial to the stability of the economy.

The determinants of profitability are empirically well explored although the definition of profitability varies among studies. Disregarding the profitability measures, most of the banking studies have noticed that capital adequacy, loan-loss provisions and expense control are important drivers of high profitability. In this study, the drivers that are considered are in two categories: endogenous (internal) and exogenous (external) drivers or factors of profitability. Internal drivers to predict bank performance or profitability can be defined as factors that are influenced by a bank's management decisions. Such management effects will definitely affect the operating results of banks. Although quality management leads to good bank performance, it is difficult, if not impossible, to assess management quality directly. As such, it is common to examine a bank's performance in terms of those financial variable found in financial statements, such as the balance sheet and income statement. External determinants of bank profitability are factors that are beyond the control of a bank's management. They represent events outside the influence of the bank. However, the management can anticipate changes in the external environment and try to position the institution to take advantage of anticipated developments. The two major components of the external determinants are macroeconomic factors and financial structure factors.

This study examines the profitability of a selected bank for that matter during the last decade, and investigates the key value drivers of performance or profitability of the selected bank.

1.2 Background of the Study

The composition of the formal financial sectors in Ghana was as a result of financial policies pursued over the years. Deliberate policies were implemented to enhance the efforts of institutional building based on the financial service needs of the nation at various stages of its development. Policies aimed at addressing weaknesses inherent in the colonial banking system as well as streamlining the banking operations were initiated.

Over the years, specialized banks were created. The objectives of these banks were tailored to meet the financial needs of specific sectors of the economy and promote the development needs of these sectors. For instance, banks were established to promote investment, construction and agricultural development in Ghana. Along the line, the Government also created several rural banks, which were widely, dispersed throughout the country. This was to enhance the financial deepening of the rural economy so as to facilitate the mobilization of rural resources for the financing of micro and other small-scale economic activities in their catchment areas.

The banking sector in Ghana comprises thirty-two (32) Deposit Money Banks (DMB's) and one hundred and forty-one (141) rural banks. Currently all banks in Ghana are operating as universal banks, which opens endless opportunities to the product range that they may offer. The banking sector has seen the arrival of many banks from the sub-region as it is the policy of the central bank to issue licenses to

international banks with repute. The policy is geared toward supporting the development of a well-capitalized and robust financial system (PriceWaterhouseCoopers, 2008).

1.3 Statement of the Problem

Prior to the onset of the Economic Recovery Programmes in the early 1983, and Financial Sector Adjustment Programmes (FINSAP) was embarked upon in 1988 to address the weakness in the banking industry. For the past 23 years FINSAP was implemented, during that time the numbers of banks were few and with high interest rates, the banks were assured of handsome spreads that remarkably improved their profit levels. The liberation of the Ghana banking industry has led to an increase in the intensity of the competition in the industry and has eroded the profit levels of the most profitable sectors of the economy. To this end banks need to appreciate the role of other indicators in enhancing the profitability or performance for that matter. Indeed examining the determinants of banks profitability is crucial, if these banks are going to remain competitive, efficient, and viable taking into cognizance the challenges that befall competition in their industry.

1.4 Aims and Objectives

The main aim of the study is to investigate the factors or indicators that impact bank profitability and their performance.

Specifically the study seeks to achieve the following objectives.

- i. To examine exogenous value drivers of performance of the bank's in Ghana.
- ii. To assess endogenous value drivers of performance of the bank's in Ghana
- iii.

To assess the combine effect of endogenous and exogenous value drivers of performance or profitability of the bank in Ghana.

1.5 Research Questions

- i. To what extent do endogenous factors explain profitability of banks in Ghana?
- ii. To establish how exogenous factors explain profitability of banks in Ghana?
- iii. To ascertain whether endogenous or exogenous are key in explain profitability of banks in Ghana?
- iv. How significant are the drivers or variable identified in each of these categories (endogenous or exogenous) or both categories pulled together?

1.6 Hypothesis Testing

The study tested the following hypothesis

1. H_0 : The independent variable in the endogenous model are significant
 H_1 : The independent variables in the endogenous model are not significant
2. H_0 : The independent variable in the exogenous model are significant
 H_1 : The independent variable in the exogenous model are not significant
3. H_0 : The independent variables in the endogenous and exogenous model pulled together are significant.

H₁: The independent variable in the endogenous and exogenous model pulled together are not significant.

4. H₀:The explanatory variation are independent (test for homoskedastic)

H₁: The explanatory variations are not independent.

5. H₀: The adjacent residual are correlated.

H₁: The adjacent residual are not correlated (test for autocorrelation)

The hypothesis is be tested at 5% level of significance (95% confidence level)

1.7 Scope of the Study

The study uses the National Investment bank, Universal Merchant bank and Ghana Commercial bank as case studies; however results can be generalized to cover all commercial banks in Ghana.

1.8 Justification of the Study

The function of the banking system including providing payments and settlements systems, mechanism for borrowing and lending, and pooling and allocation of funds, among others impinge on all aspects of economy. The efficacy of the financial systems in performing these functions is a major ingredient to the economy as a whole. Given the pivotal role of banking in an economy, the role of competition in this industry is particularly important.

Survival of today's competition environment depends on performance and growth. Competition has implications for efficiency, innovation independent variable in the endogenous model are not significant, pricing, and availability of choice, consumer

welfare, and the allocation of resources in the economy. Though there have been several studies on the impact of financial sectors reforms (FINSAP) on banks in Ghana, none of these address the appropriate tool to predict bank performance. This study will help us to know the more powerful tool in predicting bank performance.

This research shall also serve as a foundation to anybody who wants to undertake similar studies, to unearth new ideas for future research and finally to the existing limited body on prediction of bank performance.

1.9 Limitations of the Study

The study area will be limited to the three banks, due to time constraints and inability to include the pre-FINSAP period due to scarcity of data. Information sourcing might be a challenge as some companies only publish scanty financial information. That notwithstanding, efforts will be advanced to ensure the study's reliability and validity.

1.10 Organization of the Study

This study has five main segments with each segment treating a unique area with regards to the entire work. Chapter One deals with the brief introduction, background of the study, post-independence financial sector policies, interest rate policy, prudential regulation and supervision, financial sector adjustment programme, restructuring the public sector banks, reforms to the prudential system, statement of the problem, research questions, objectives of the study, hypothesis testing, scope of the study and justification of the research. Chapter Two covers the literature review and the framework including, theoretical framework, trends in monetary growth, GDP and inflation, a simple theoretical model of inflation determination in Ghana and empirical literature. Chapter Three deals with the methodology of the study. It covered data source, sampling or selection of banks, model, variables, model diagnosis and hypothesis testing. Chapter Four comprises the data analysis and the discussions of the

findings. Finally, Chapter Five presents the summary, conclusions and recommendations offered on the findings of the study.

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CHAPTER TWO

Literature Review

2.1 Introduction

In this chapter, we shall put forward relevant literature on researchers in the banking and finance who have indicated that bank performance is related to internal and external factors. Banks profitability, typically measured by the Return on Assets (ROA) or the Return on Equity (ROE). In most bank studies, these are usually expressed by the bank's management decisions and policy objectives. Such profitability determinants are the level of liquidity, provisioning policy, capital adequacy, expense management and bank size. On the other hand, the external determinants related to both industrial and macroeconomic conditions, are variables that affect the economic and legal environments where the financial institutions operates (Sufian and Chong, 2008).

Buchs and Mathiesen (2008) noted in an article on "banking competition and efficiency in Ghana", that despite high overhead costs and sizeable provisioning, Ghanaian bank's pre-tax returns on assets and equity are among the highest in subSaharan African. In a speech delivered by the Governor of the Bank of Ghana, Dr. Paul Acquach at the 8th Ghana Banking awards, the governor noted that Ghana's banking sector is "reasonable efficient, financially innovative, profitable and growing rapidly" The governor, who was in 2008 voted Africa's Central Bank governor of the year also stated that the size of the balance sheet of Ghana's banking system expanded by 372 percent to 52.5 percent of GDP in 2008 from 27.3 percent of GDP in 2003. Total deposits have risen to 34.4 percent of GDP from 23.4 percent of GDP in 2003. Ghana's banking industry, the governor noted, also has a branch network of 642 in 2009 compared with 332 in

2003 and noted in conclusion that, the Ghanaian banking sector is on a sound footing and well positioned to strengthen its intermediation role. Ghana's banking system is currently on an upswing and does not seem to have been greatly affected by the global economic crisis. In an article published on www.myjoyonline.com entitled "Central Bank governor lauds Ghana's robust banks" it was noted of the Ghanaian banking industry that "stringent test indicate the local industry is quite robust to external shocks given the current levels of capital adequacy of banks". The same article also noted that, over the past years Ghana's financial sector has been built on a strong regulatory and supervising framework".

To the extent that undergraduate students and the growth market would generally tend to be technologically friend and generally represent the digital generation; there has been a recent financial innovation, which is worthy of note in Ghana's financial service sector. The E-Zwich, a common electronic platform introduced in 2008, makes it possible to integrate and link all banking institutions with a biometric smart card and is a vehicle for financial inclusion of all Ghanaian (Paul Acquah, 2006).

2.2 Theoretical Framework

The relationship between bank performance or profitability and changes in macroeconomic variables has attracted much attention in research. It has been pointed out that bank performance can be explained by bank specific characteristics and macroeconomic variables.

Bank performance can be explained by bank specific factors such as the size of the bank, net profit to total asset ratio, loan to asset ratio, on interest expense to net revenue ratio. These variables have been explained in details. Regarding the size, it would be expected that the larger the bank, the higher the level of profitability due to economies

of scale. Akhaveet al.,1997) and Smirlock (1985) found a positive relationship between the size of a bank and bankperformance.According to Short (1979) the size of a bank is positively related to bank performance since relatively large bank tend to raise less expensive capital hence become more profitable. Others such as Heslem (1965), Bourke (1989), Molyneux and Thornton (1992) all argued that bank size is positively related to bank performance. Many other researchers such as Berger et al., (1987) argued that eventually very large banks could face the problems of diseconomies of scale, which amounts to inefficiency.

Big banks may have lower degree of being bankrupt hence size is considered as a determinant of bank performance, Bikker and Hu (2002).

According to Agbanzo (1997), the proxies for default risk, the opportunity cost of net interest-bearing reserves, leverage and management efficiency are all statistically significant and positively related to bank interest margin.

The bank characteristic variables used in the banking performance literature has been referred to as internal determinants of bank performance studies into the area employ variables such as size, capital, risk management and expenses management to explain bank performance. According to Thornton (1992), poor asset quality and low level of liquidity are the two main causes of bank failure. During periods of increased uncertainty, financial institutions may decide diversify their portfolios and raise their liquid holdings in order to reduce their risk. In this respect, risk can be divided into credit and liquidity risk.

Macroeconomic control variables that may influence bank's performance include inflation rate and interest rate of money supply (Revell, 1979). The author admitted

that the effect of inflation on bank performance depends on whether bank's wage and other operating expenses increase at a faster rate than inflation.

Penny (1992) stated that the extent to which inflation affects bank performance depends on whether inflation expectations are fully anticipated. This implies that when banks fully anticipate inflation changes, the management can appropriately adjust interest rates in order to increase their revenue faster than their cost. Existing literature indicates that performance of banks can be explained by the bank's own specific characteristics such as the size, proxy by the total assets, equity-capital-to asset ratio, loan-to-asset ratio, non-interest-expense-to-net-revenue ratio, and bank concentration ratio. These are commonly employed explanatory or control variables in many bank performance studies. Explanations have been offered in support of these variables. For instance, in terms of the size of the bank, it would be expected that large or big banks would enjoy economies of scale and high efficiency in their operations hence high profitability compared to smaller banks.

Akhavain et al., (1997) and Smirlock (1985) found a positive and significant relationship between size and bank profitability. Demirgüç -Kunt and Maksimovic (1998) suggested that the extent to which various financial, legal and other factors (e.g. corruption) affect bank performance is closely linked to firm size.

In addition, Short (1979) argued that, the size is closely related to the capital adequacy of a bank since relatively large banks tend to raise less expensive capital and, hence, appear more profitable. Using similar arguments, Haslem(1968), Short (1979), Bourke (1989), Molyneux and Thornton (1992) Bikker and Hu (2002) and Goddard et al., (2004), all link bank size to capital ratios, which they claim to be positively related to size, meaning that as size increases, especially in the case of small

to medium-sized banks, profitability rises. However, many other researchers suggested that little cost saving can be achieved by increasing the size of a banking firm (Berger et al., 1987).

Big banks may also have lower degree of being bankrupt hence size is considered as a control variable in studies that have attempted the determinants of banks performance. The higher a bank's equity capital to total assets ratio, the less tendency for the bank seeking external financing for its operations. This will enhance its performance and net income margin.

It may represent risk or stability of the bank against external shocks. Specifically, in a study of performance for a sample of banks in four European countries, Molyneux, Lloyd-Williams and Thornton (1992) included a capital-to-asset ratio and a loan-to-asset ratio to account for bank-specific risk, on the grounds that their dependent variable (total interest revenue per dollar of assets) is not risk-adjusted.

Samolyk (1994) stated that "Differences in loan/asset ratios and bank capitalization are important factors in assessing the relative profitability and risk of banks"(1994) states that "Differences in loan/asset ratios and bank capitalization are important factors in assessing the relative profitability and risk of banks".

A study by Demirgüç-Kunt and Huizinga (1999) investigated the determinants of bank interest margins using bank-level data for eighty (80) countries in the years 1988-1995 using a set of variables accounting for bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and underlying legal and institutional indicators. Demirgüç-Kunt and Huizinga reported that the bank interest margin is positively influenced by the ratio of

equity to total assets, by the ratio of loans to total assets, by a foreign ownership dummy, by bank size as measured by total bank assets, by the ratio of overhead costs to total assets and macroeconomic variables such as inflation rate and the short-term market interest rate in real terms. The ratio of noninterest earning assets to total assets, on the other hand, is negatively related to the bank interest margin (Demirgüç-Kunt and Huizinga (1999).

Angbazo (1997) studied the determinants of bank net interest margins for a sample of US banks using annual data for 1989-1993. The results for the pooled sample suggest that the proxies for default risk (ratio of net loan charge-offs to total loans), the opportunity cost of on-interest bearing reserves, leverage (ratio of core capital to total assets), and management efficiency (ratio of earning assets to total assets) are all statistically significant and positively related to bank interest margins. The ratio of liquid assets to total liabilities, a proxy for low liquidity risk, is inversely related to the bank interest margin.

Brock and Rojas-Suarez (2000) explored the determinants of interest rate spread for as ample of five Latin American countries (Argentina, Bolivia, Colombia, Chile, and Peru). For each country, regressions for the bank interest spread include variables controlling for non-performing loans, capital ratio, operating costs, a measure of liquidity (the ratio of short term assets to total deposits) and time dummies. Their findings showed positive coefficients for capital ratio (statistically significant for Bolivia and Colombia), cost ratio (statistically significant for Argentina and Bolivia), and the liquidity ratio (statistically significant for Bolivia, Colombia, and Peru).

As for the effects of non-performing loans, the evidence is mixed. Apart from Colombia, where the coefficient for non-performing loans is positive and statistically

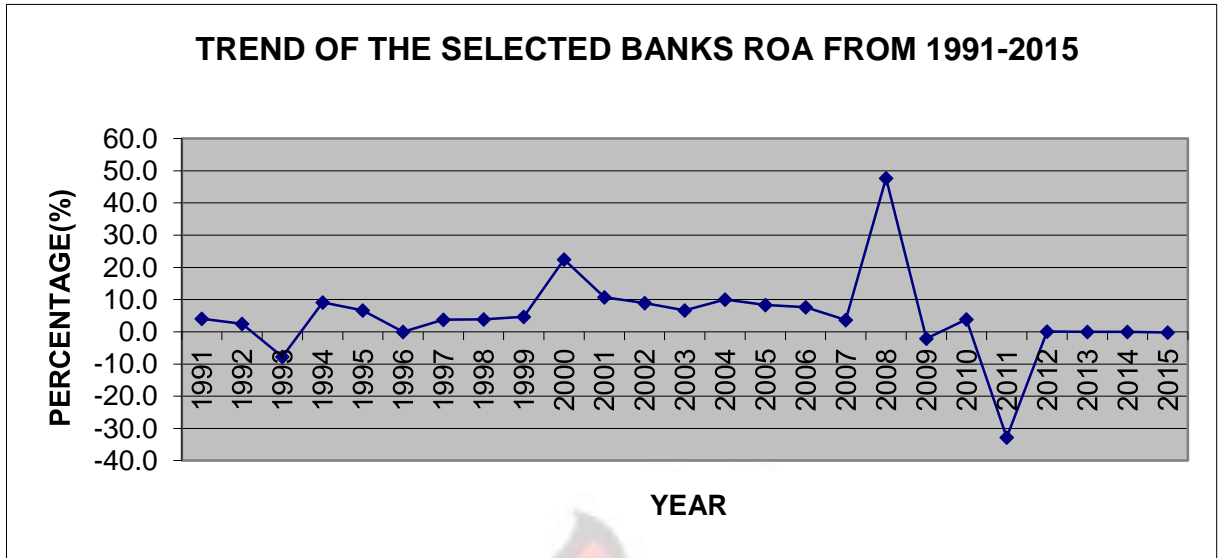
significant, for the other countries the coefficient is negative (statistically significant for Argentina and Peru). The authors explained these findings as “a result of inadequate provisioning for loan losses: higher non-performing loans would reduce banks ‘income, thereby lowering the spread in the absence of adequate loan loss reserves”.

The bank characteristic variables used in the banking performance literature has been referred to as internal determinants of bank performance and studies dealing with internal determinants employ variables such as size, capital, risk management and expenses management. The need for risk management in the banking sector is inherent in the nature of the banking business. Poor asset quality and low levels of liquidity are the two major causes of bank failures. During periods of increased uncertainty, financial institutions may decide to diversify their portfolios and/or raise their liquid holdings in order to reduce their risk.

In this respect, risk can be divided into credit and liquidity risk. Molyneux and Thornton (1992) among others, found a negative and significant relationship between the level of liquidity and profitability.

Bourke (1989) reported an opposite result; while the effect of credit risk on profitability appears clearly negative (Miller and Noulas, 1997).

This result may be explained by taking into account the fact that the more financial institutions are exposed to high-risk loans, the higher the accumulation of unpaid loans, implying that these loan losses have produced lower returns to many commercial banks.



Source: authors' compilation from the banks financial statements

Figure 2.1: Trend of the selected banks Return on Asset from 1991-2015

The trend in figure 2.1 is an evidence that performance of the banks have been highly unstable, with two periods (1991 and 2015) recording negative returns on assets. This is indeed calls for much scrutiny given that size of the banks under study and the resources available to them, which enhances their competitive advantage over the rest of the universal banks in Ghana. Within the same period where the selected banks were making losses, most of the other universal banks were recording not just positive returns, but quite impressive two digit positive returns.

2.3 A Simple Theoretical Model of Inflation Determination in Ghana

The general price level can be expressed as a weighted average of the price of tradable goods (P^T) and non-tradable goods (P^N): where $0 < \theta < 1$

$$\log P = \theta(\log P^N) + (1 - \theta)(\log P^T) \quad (2.1)$$

The price of tradable goods is determined in the world market and depends on foreign price (P^f) and on the exchange rate (e). In domestic currency terms, P^T can be depicted by the following expression:

$$\log P^T = \log e + P^f \quad (2.2)$$

As can be seen from (2), both an increase in the exchange rate and an increase in foreign prices lead to an increase in domestic prices.

The price of non-tradable goods is assumed to be determined in the domestic money market, where it is assumed that the demand for non-tradable goods moves in line with the overall demand in the economy. Accordingly, the price of non-tradable goods is determined by the money market equilibrium condition, where real money supply (M^s/P) equals real money demand (m^d):

$$\log P^N = \beta (\log M^s - \log m^d) \quad (2.3)$$

Where β is a scale factor illustrating the relationship between economy-wide demand and demand for non-tradable goods. It is assumed that the demand for real balances is a function of real income and inflationary expectations. Due to relatively undeveloped financial markets in Ghana, it is assumed that the relevant substitution is between goods and money and not among different financial markets. Consequently, the opportunity cost of substitution between goods and money is the expected inflation rate.

$$m^d = f(y, \pi^e) \quad (2.4)$$

The expected rate of inflation is assumed to be determined by inflation in the previous period:

$$\pi^e = \Delta \log P_{t-1} \quad (2.5)$$

The theory predicts that an increase in real income will lead to an increase in money demand, while an increase in expected inflation will lead to a decrease in money demand. Substituting and rearranging, we obtain the following estimable equation:

$$\log P_t = \alpha \log M_t + \phi \log y_t + \delta \log P_{t-1} + \nu \log e_t + \gamma \log P^f \quad (2.6)$$

Where theory predicts that an increase in money supply, expected inflation, the exchange rate and foreign prices will all drive prices up, while an increase in real income will lead to a decline in the inflation rate. The effect of sluggish adjustment due to rigidities and inertia can be captured by adding the effect of lagged prices to the equation.

2.4.0 Trends in Monetary Growth, GDP and Inflation in Ghana

A look at monetary growth trends between 1983 and 1999 as represented in Table above indicates that broad monetary growth peaked at 62.5% in 1985. (Bank of Ghana and Quarterly Digest of Statistics (various issues). Thereafter, the pursuit of a tighter monetary policy resulted in broad money growth reducing to 20.60% by 1990. By 1991 broad money growth was 26%. Over the period 1983 to 1991 inflation so declined from a peak of 122.8% in 1983 to 10.2% by 1991.

Bank of Ghana and Quarterly Digest of Statistics (various issues)

The empirical evidence is thus suggestive, as theory will predict that a slower money supply growth reduces inflation and the rate of depreciation of the cedi.

Table 2.1: GDP, Monetary Growth and Inflation in Ghana 1991-2015.

Annual percentage changes

YEARS	GDP(MILLION GH¢)	INFL	MSGR (M2+)
1991	257	10.30	26.21
1992	301	13.30	52.97
1993	387	27.70	34.65
1994	521	34.20	53.17
1995	775	70.80	40.70
1996	1,134.00	32.70	34.20
1997	1,411.00	20.80	39.50
1998	1,729.00	15.70	17.60
1999	2,058.00	13.80	23.90
2000	2,715.00	40.50	46.50
2001	3,807.00	21.30	41.40
2002	4,886.00	15.20	50.00
2003	6,616.00	23.60	37.80
2004	7,989.00	11.80	26.00
2005	9,726.00	14.80	14.30
2006	11,490.00	10.50	38.80
2007	14,046.00	12.75	36.30
2008	17,618.00	18.13	40.20
2009	21,747.00	15.97	26.90
2010	46,042.00	8.58	34.40
2011	59,816.00	8.70	33.20
2012	75,315.00	9.20	24.30
2013	93,416.00	11.70	19.10
2014	113,343.00	15.50	36.80
2015	139,936.00	17.20	26.10

Source: Bank of Ghana and Quartely Digest of Statistics (various issues)

The rate of monetary growth doubled between 1991 and 1992 from 26% to 53%.

Broad money growth fell to 34.65% in 1993 but increased again to remain around 40% by 1997 .By 1998, monetary growth was reduced to 17.6%. Between 1991 and 1995, inflation increased from 10.26% to 70.82%. Thereafter, inflation was reduced to 20.83% by 1997 and further to 15.7% by 1998. While the results are mixed, one can

argue that the increased broad money growth after 1991 resulted in the high inflation of 70.82% by 1995. On the other hand, the slower broad money growth by 1998 is also the likely cause of the lower inflation levels by 1998.

The trends in figure 2.2 show the relationships between GDP, monetary growth and inflation.

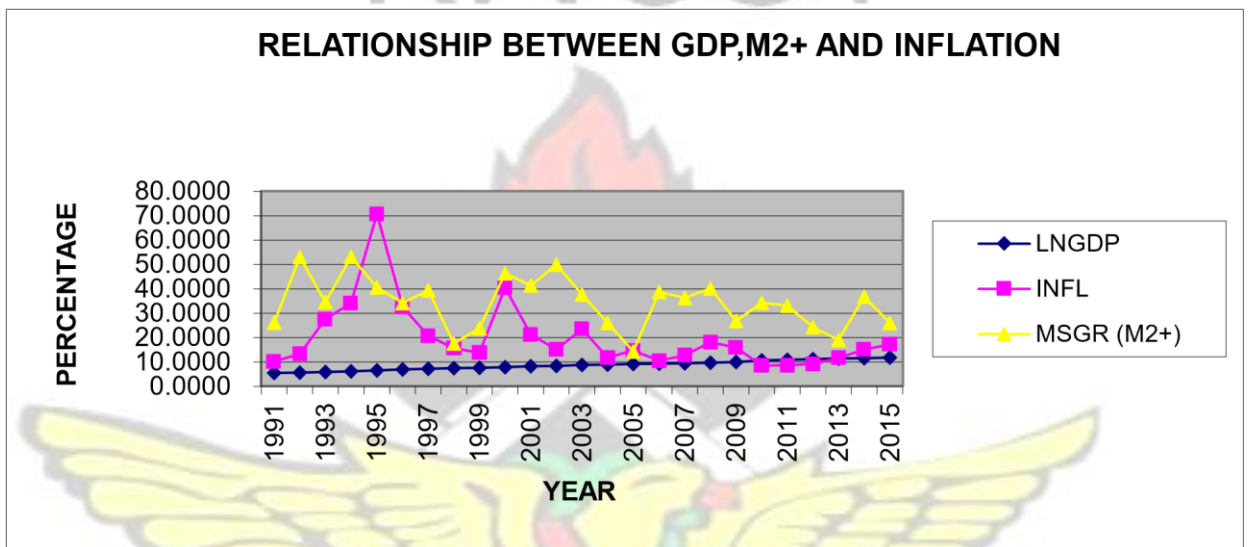


Figure 2.2: Relationship between GDP, M2+ and inflation

The analysis so far suggests that money and GDP may have a significant impact on inflation in Ghana. It is interesting to observe that all the monetary aggregates peak in the fourth quarter. This is what we refer to as the fourth quarter hump in money supply arising from cocoa financing and rising demand for money for Christmas shopping. The relationship show the seasonal pattern of inflation. What is interesting is that the fourth quarter hump observed for money supply has turned in to a fourth quarter trough for inflation. This suggests the presence of lags in the transmission of money supply changes to inflation.

Since pictures can be deceiving, it is important that a thorough empirical analysis with a sound theoretical foundation be undertaken to explore the links between inflation, money supply growth and GDP.

2.4.1 Post Independence Financial Sector Policies

Extensive government intervention characterized by financial sector policies in the post-independence period (Brownbridge and Gockel., 1997). Public ownership dominated the banking system: all the banks set up between the early 1950s and the late 1980s were wholly or majority owned by the public sector, while the government also acquired minority shares in the two already established foreign banks in the mid 1970s. Interest rates were administratively controlled by the Bank of Ghana (BoG) and a variety of controls were also imposed on the asset allocations of the banks, such as sectoral credit directives. The motivation for these policies was the belief that, because of market imperfections and the nature of the financial system inherited from the colonial period, the desired pattern of investment could not be supported without extensive government intervention in financial markets.

Policies were motivated by three objectives:

To raise the level of investment, to change the sectoral pattern of investment, and to keep interest rates both low and stable (Gockel, 1995). Financial sector policies were characterized by severe financial repression, real interest rates were steeply negative and most of the credit was channelled to the public sector.

2.4.2 Interest Rate Policy

The BoG determined the structure of bank interest rates, including minimum interest rates for deposits and maximum lending rates. Priority sectors, such as agriculture, received preferential lending rates: in some cases these were lower than the minimum

savings deposit rates. The structure of interest rates set by the BoG made no allowance for loan maturity or risk; indeed incentives for banks to extend credit were often perverse because riskier sectors such as agriculture were accorded a preferential rate. Nominal interest rates were held below prevailing inflation rates in most years and, when inflation accelerated in the second half of the 1970s and early 1980s; real interest rates were highly negative.

2.4.3 Prudential Regulation and Supervision

The 1970 Banking Act provided the regulatory framework for the banking industry. This imposed minimum paid up capital requirements for foreign and locally owned banks of GH¢ 2.0 million and GH¢ 5.0 million respectively (the latter was subsequently raised to GH¢75.0 million). The minimum capital requirements were worth very little by the early 1980s because of inflation. At the end of 1983, the minimum paid up capital for a local bank was equivalent to only \$16,000. Banks were also required to maintain capital and reserves of at least 5% of their total deposits (rather than risk assets, which would be more relevant as an insurance against insolvency, Acquah,2006)

The capital adequacy requirements were in any case largely meaningless because of the absence of clear accounting rules regarding the recognition of loan losses, provisioning for non-performing assets and the accrual of unpaid interest. The true state of banks' balance sheets, including the erosion of their capital as a result of loan losses, could therefore be concealed.

Although the Banking Act did provide some rules to constrain imprudent behaviour by banks, penalties for infractions were minimal. There were also important regulatory omissions, such as limits on single borrower loan exposures. A Bank

Examination Department (BED) was established in the Bank of Ghana (BoG) in 1964 but its activities were largely confined to ensuring that banks complied with allocative and monetary policy directives, such as sectoral credit directives, and reserve requirements, rather than prudential regulations. The BED also lacked adequate resources to monitor and inspect the banks. In the early 1980s it had only five professional staff, of which only two had any training in bank supervision. On site examinations were infrequent and off site supervision was impeded because of deficiencies in bank reporting (i.e. the submission of financial data by the banks to the BoG). Hence the BED lacked the information necessary to evaluate the condition of banks' asset portfolios, their profitability and solvency (World Bank, 1986).

2.4.4 Financial Sector Adjustment Programme (FINSAP)

The comprehensive economic adjustment program which embodied the financial sector reform started in April 1983 following years of continuous decline in economic performance. The first phase of the Economic Recovery Program (ERP) dated from 1983 to 1986 and focused on stabilization measures. The policies implemented include currency devaluation, tighter fiscal management, and liberalization of prices including interest rates.

Financial sector reforms have been implemented since the late 1980s as part of the ongoing Economic Recovery Programme (ERP). They began with the partial liberalisation of interest rates in 1987 and removal of sectoral credit ceilings in the following year. This was accompanied by liberalisation of access to foreign exchange and the licensing of foreign exchange bureaux. In 1989 the Financial Sector

Adjustment Programme (FINSAP) was begun, supported by a financial sector adjustment credit (FSAC) from the World Bank.

The objectives of the FINSAP, inter alia, were to address the institutional deficiencies of the financial system, in particular by restructuring distressed banks, reforming prudential legislation and the supervisory system, permitting new entry into financial markets by public and private sector FIs, and developing money and capital markets. Further liberalisation of financial markets took place in 1992 with the adoption of indirect instruments of monetary control, which entailed the introduction of market determined Treasury bill rates. Since 1994 a second phase of the FINSAP has been underway, major objectives of which are the privatisation of public sector banks and development of non bank financial institutions (NBFIs) to fill the gaps in the financial markets not served by the banks. The following sections discuss the progress, achievements and limitations of the three components of the FINSAP, which most directly affect the banks; bank restructuring, reforms to the prudential system and the liberalisation of financial markets.

2.4.5 Restructuring the Public Sector Banks

The restructuring of the public sector banks began in 1989, and involved balance sheet restructuring and reforms to their management and operating procedures.

Balance sheet restructuring was necessary because the banks were insolvent and the magnitude of their Non-Performing Assets (NPAs) was too large for them to be able to restore adequate levels of capitalisation from future profits. Hence recapitalisation from public funds was necessary. NPAs amounting to €62 billion (\$170 million or 4.4% of 1989). Gross Domestic Product (GDP) were removed from the banks' balance sheets and replaced with BoG bonds or offset against debts owed to the government or the

BoG in 1990/91. A specialised government agency - the Non-Performing Assets Recovery Trust (NPART) - was set up to take over the NPAs and attempt to recover as many of them. Non-Performing Assets Recovery Trust (NPART) received ₵50.4 billion of NPAs in 1991 and had recovered ₵14.1 billion by the end of 1994 (NPART, 1994, p6). A further ₵5.1 billion of NPAs were transferred to NPART from the Ghana Cooperative Bank in 1994. In addition the BoG assumed responsibility for some of the foreign currency liabilities of the DFIs and the Social Security Bank (now SG-SSB). The replacement of NPAs in the banks' balance sheets enabled all but one of the public sector banks to meet, by the end of 1990, the minimum capital adequacy requirement of 6% of adjusted assets prescribed in the 1989 Banking Law. Not all of the banks' NPAs were transferred to NPART. Some of those regarded as unrecoverable, especially small loans to farmers, were not transferred. The banks were given bonds with maturities of two-five years yielding interest rates of between 7% and 12%. They were subsequently rolled over at rates of 15% (World Bank, 1994, p56). The exception was the Ghana Cooperative Bank.

In addition to recapitalisation it was necessary to reform the management and operating procedures of the banks to prevent bad debts from recurring, and to reduce operating costs. New boards of directors and executives were appointed to the public sector banks in 1990, and turnaround plans formulated for each of the banks. Technical assistance was provided through twinning arrangements with foreign banks such as the State Bank of India. The restructuring involved the overhaul of credit policies and strengthening of credit appraisal, loan monitoring and loan recovery systems, areas which had been particularly weak prior to the reforms. Internal controls, inspection and audit were improved and budgetary and performance appraisal systems were introduced. Staff training programmes were enhanced.

To cut costs, staffing levels were reduced by 38% between 1988 and 1992, and some bank branches were closed (World Bank, 1994, p57; National Investment Bank, 1991; interviews in Accra, 1995 and 1996).

The Social Security Bank (SG-SSB) now concentrates on commercial banking and no longer undertakes equity investments in new ventures: such investments were the source of many of its NPAs prior to the restructuring. However the GCB has been pressured by the government to continue financing some of the larger SOEs (World Bank, 1994, p57; National Investment Bank, 1991; interviews in Accra, 1995 and 1996).

A further safeguard against political interference in banks would be their privatisation, the first stage which began in 1995 when the government sold part of its equity stake in the Social Security Bank (SG-SSB) to the public and then sold 30% of its shares in GCB in 1996.

There were plans for the divestiture of government equity in the DFIs but up to date that has not materialised. In the sixteen years since the restructuring exercise began the financial performance of the public sector banks has been reasonably good, with the exception of the Ghana Cooperative Bank and Bank for Housing and Construction, which were still insolvent from 1995 and were closed down in 2000. Banks in Ghana have generated profits, their rates of return to capital have exceeded inflation on average during 1991-95, they have built up their capital and reserves, have been able to meet the minimum capital adequacy ratios imposed by the 1989 Banking Law, and have generally been highly liquid. The banks are however, still afflicted by significant levels of NPAs, albeit not at the levels which prevailed prior to the restructuring, even though the share of loans in their asset portfolios are low.

The GCB made annual provisions for bad and doubtful debts, out of earnings, equivalent to almost 14% of its total loans during 1991-95, while the SSB, ADB and NIB made provisions averaging around 5% of their loans.

The financial position of the GCB must still be a cause for some concern. It suffered a sharp drop in shareholder funds, in loans and advances and in total assets in 1994, for reasons which are not transparent because it published no annual report for that year or for 1995, and its capital adequacy ratio declined steeply in 1995. As noted above, it has had to make extensive provisions (provisions and interest in suspense amounted to 43% of its outstanding loans and advances in 1995) which indicates that a large share of its loan portfolio is nonperforming. It experienced liquidity shortages in late 1993/early 1994, although it claimed this was not its fault. Since the restructuring exercise began the banks have done very little lending: most of their assets have been held as liquid assets, primarily government and BoG securities, which since the introduction of the T-Bill auction have provided a remunerative and safe source of income. (World Bank, 1994, p57; National Investment Bank, 1991; interviews in Accra, 1995 and 1996).

The average ratio of loans to total assets of the five public sector banks in Ghana was only 22% during 1991-95. The low level of lending is only partly attributable to the high liquid asset ratios imposed by the BoG.

Bankers interviewed in 1995/96 conceded that creditworthy borrowers were very scarce and that they would be reluctant to increase lending even if reserve ratios were lower, especially in view of their past experience of bad debts. From the point of view of asset management, restoring financial viability to the public sector banks has been relatively straightforward. Banks have been able to avoid the much more difficult task

of building up an income generating loan portfolio, which would have necessitated them identifying and servicing commercially viable and creditworthy business projects, or at least borrowers with adequate security.

While the restructuring has enabled the banks to stop making bad loans, it is not yet clear that it has enabled them to make good loans especially during 1999 to 2000. This is due to the macroeconomic environment (high inflation, high interest rates and depreciation of the Cedi). Banks became interested in Government T-bill instruments. The trend is gradually decline since 2001 due to the stability in the economy. The banks will then have to expand their lending to the private sector or to SOEs. Whether they have been able to develop the capacity to undertake commercially viable lending will indicate how successful the restructuring of the banks has actually been.

2.4.6 Reforms to the Prudential System

The reforms to the prudential system entailed revisions to the banking legislation with the enactment of a new Banking Act in 1989 and an NBFIs Act in 1993 (NBFIs had not previously been covered by financial legislation), the introduction of standardised reporting and accounting procedures, and the strengthening of supervisory capacities in the BoG. The 1989 Banking Law initially imposed minimum paid up capital requirements for Ghanaian and foreign owned commercial banks of GH¢200 million and GH¢ 5.0 billion respectively, and GH¢ 1 billion for development banks providing medium and long term finance for trade and industry. Currently the figure has been revised to GH¢ 70 billion for universal banking business and GH¢ 25 billion for Commercial banking business. (Banking Act 2004).

The BoG has the authority to amend the capital requirements. An upward revision of the capital requirements has become increasingly urgent in view of the high rates of

inflation in the 1990s. The Banking Law initially sets a minimum capital adequacy ratio of 6% of adjusted risk assets and requires banks to maintain reserve funds with transfers out of annual profits and currently the capital adequacy ratio has been reviewed to 10%. The Law also gives the BoG the authority to prescribe minimum liquid asset ratios.

The ₵ 200 million required to open a locally owned commercial bank was equivalent to \$1 million in 1989 but this had fallen to only \$117,000 by mid 1996. The capital adequacy provisions differ in two respects from those set out in the Basle accords. The required minimum is lower: 6% against 8% in the Basle accords. However the adjusted asset base which forms the denominator for the capital adequacy requirement is larger under the Ghanaian Banking Law than it would be under the Basle accords, mainly because the Ghanaian schedule recognizes only two classes of assets (assets given a risk weighting of 100% and those regarded as riskless) rather than the five classes of assets in the Basle accords (Banking Act 2004).

Assets, which under the Basle accords attract a weighting of less than 100% (e.g. mortgages) are given a 100% weighting under the Ghanaian Banking Law, and hence are required to be supported by a larger amount of capital in the latter. The main use of the liquidity ratios is for monetary policy rather than prudential purposes (Banking Act 2004).

The Banking Law stipulates exposure limits for secured credits or guarantees to a single customer (except for other banks) of 25% of the bank's net worth, and unsecured credits or guarantees of 10% of net worth. To restrict insider lending, exposure to customers with links to the bank's own directors is limited to a maximum of 2% of net worth for secured facilities and 2/3% of net worth for unsecured facilities. Banks cannot advance

credit against the security of their own shares or directly engage in non banking business, and the Banking Law restricts equity investments and loans which banks can extend to subsidiary companies.

However the Law does not set out limits on a bank's foreign currency exposures. The Banking Law gives the BoG authority to take action against a bank which it believes may be unable to meet its obligations to depositors, or is not acting in the best interests of depositors and creditors. Action available to the BoG includes prohibiting acceptance of fresh deposits, assuming control of the bank or revoking the bank's license (Banking Act 2004).

A standardised accounting system for the banks, which includes explicit criteria for the classification of loans, provisioning for non-performing assets and the no accrual of unpaid income, has also been introduced. To facilitate offsite supervision, banks are required to submit, to the BoG, a variety of statistical data at regular intervals, including data on large exposures, non-performing loans and connected lending. The banks are generally complying with the reporting requirements, although reports are not always submitted on time. The Bank

Supervision Department (BSD) of the BoG has been strengthened with staffing levels more than doubled to over eighty (80) and supervisory skills upgraded through training. Regular on site examinations are now taking place in line with the requirements of the Banking Law which stipulates that the BoG must examine each bank at least once a year. Bank examinations are able to investigate the accuracy of the banks' reports to the BoG, including the veracity of their loan classification (Banking Act 2004).

Supervisors claim that they are under no government pressure to regulate the government owned banks less stringently. The new Bank of Ghana law gives BoG that

independence. While the reforms are likely to have considerably improved bank regulation and supervision in Ghana, how effective the prudential system has become with regards to the closure of BHC and Coop Bank in 2000 is subject to debate (Bank Act 2004).

The banking system has been relatively easy to supervise during the 1990s for two reasons:

- (i) because of the very high reserve requirements and the availability of high yielding government and BoG securities, all of the banks have adopted conservative asset management with lending and other risk assets forming a small share of their total portfolios (loans amounted to only 20% of the banks' total assets in 1994). As such the scope for imprudent banking behaviour has been limited.
- (ii) the numbers of banks which the BoG has had to supervise has not been large: during 1991-1994 there were only fourteen (14) banks operating in Ghana and currently we have thirty-two (32) banks. Hence supervisory resources were not dissipated among numerous banks.

From the year 2000, real GDP finally lifted itself from within the approximately 4.0% trough it had remained for the best part of the period from 1998 to 2001; it took from 4.5% in 2002 and climbed steadily to 6.2% by end of 2006. On average, agriculture led growth at 6.1%, industry (5.6%), and services (5.24%). The agriculture –led growth is attributable to the strong performance of cocoa and gold exports. Generally, it is considered that economic growth would have been better had it not been for the drag from high international crude price and later on towards the last months of 2006 the energy crisis (*PricewaterhouseCoopers in association with Ghana association of bankers 2007*).

Year-on-year inflation generally trends-downward over the five-year period, beginning at 15.2% in 2002 to end at 10.96% in 2006 almost 2% off the single-digit target. Fiscal prudence- even in the face of a burgeoning fuel expense and pressure on the public sector wage bill assisted to create the macro-economic stability being felt. Overall fiscal deficit declined from 11.2 % (2002) to 4.9 % (2006), while the domestic debt-to-GDP ratio was also reduced from 29% (2002) to 10.1% (2006). This prudence paid off as the reduction in domestic borrowing by Government meant that there was more liquidity available to lend to the private sector. From all indicators, the macro-economy during the five-year period covered by the survey presented the banking industry with a very good environment for conducting profitable business. The stable environment was for business to invest in growth strategies and they needed credit to do this (*PricewaterhouseCoopers in association with Ghana association of bankers 2007*).

In 2008, the global financial crisis intensified. The year saw a collapse of reputable global financial institution and unprecedented government support for some banks in Europe and the United States. In spite of the global financial crisis the Ghanaian banking industry remained stable. Industry Return on Equity (ROE) and return on assets (ROA) remained at 22% and 2% respectively. Net interest income for the industry and net profit after tax increased by 38% and 32% respectively. All the banks adopted the International Financial Reporting Standard (IFRS) reporting framework for the year ended 31 December 2008.

The most damaging potential effect of this crisis may come from reduced remittances and capital flows. Inward remittances into the country contribute important sources of inflow for the Ghanaian economy. According to Monetary Policy Committee press

release-May 2009, the private inward transfer through the banks in first quarter of 2009 was US\$1.98 billion, 7.3% decline from those for the same period in 2008. But limited participation in global market disintermediation and lack of integration with the global financial markets appear to shield the Ghana banking from a direct impact of the crisis. The Bank of Ghana has indicated that, over the past year a number of measures have been introduced that should re-enforce the ability of banks in Ghana to withstand shocks and protect the soundness of the financial system. This includes strengthening the regulatory and supervisory framework with the passage of the Borrowers and Lenders Acts 2008(Act 773), the Non-Bank financial institution Act, 2008(Act 774), Home Mortgage Financial Act, 2008(Act 770) and the Anti Money Laundering Act, 2008(Act 749).

Economic growth achieves a remarkable turn. Estimated real GDP growth rate of 6.2% for 2008 to 7.3% this is due to economy a both domestic and international fronts. The agriculture sector continues to dominate the economy with a 34% share of total GDP. However growth for the year was only 5.1%. Dependence on the weather and elementary agricultural technology continue to hamper growth of the agriculture sector. The services sector, which contributes 31.8% of total GDP led the growth at 9.3%. Growth in the sector was widespread by significant growth in wholesale and retail ,hotels and restaurants sub-sectors, due partly to the confederation of African Nation Cup (CAN, 2008) and African Union (AU) Conference held during the year.

Inflation from 2004 and 2007, year-on-year inflation remained relatively stable between 11.0% and 14.8%. However in 2008, the inflation rate surged, rising from 12.8% at the beginning of the 2008 and peaking at 18.4% in July 2008 mainly as a result of the rise in world market prices for crude oil from US\$90.00 per barrel in

January to a record high of US\$147.00 per barrel in July. The year 2008 was also marked with preparation towards meeting the new stated capital requirements of GH¢60 million for foreign banks (banks with foreign majority ownership) by 31 December 2009 and GH¢25 million to GH¢60 million for local banks (banks with local majority ownership) by 31 December 2010 and 31 December 2012 respectively (*PriceWaterhouseCoopers, 2009-2010*).

Banks expansion programmes continued to be part of the growth strategy of banks in 2008 with a view to extending banking to the door step of customers. In response to the increasing role of Information Communication Technology (ICT) in banks' service delivery BoG published guidelines on branchless banking in August 2008 to allow collaboration between banks telecommunication companies and merchants to provide greater access to banking and financial services to the wider public. Lastly in 2008, a common electronic platform (theE-zwich) was established to further develop the payment and settlement system by making it possible to link all banking institutions with a biometric smartcard as a vehicle for inclusion of all segments of the population. In the last five years, the Ghanaian banking industry has seen a phenomenal growth arising from;

- (i) Capital injection by existing banks to meet minimum regulatory capital requirements.
- (ii) Expansion in the branch network.

Notwithstanding this phenomenal growth, high interest rates continue to be a major concern for borrowers. Banks are being called upon to justify such high interest rate regime in the country. The new capital requirements may lead to an improved buffer for risk absorption in the sector. However, increased competition, growing customer demands, and new regulations are likely to continue to add complexity to business

models of banks and information technology environment. The current economic reforms improvements in budget deficit and the new oil find which will definitely attract foreign investments and lead to buoyant economic activity. The appetite for credit will increase and bank should focus on development an efficient, effective and flexible banking infrastructure to sustain growth and manage the associated risk. With the introduction and implementing of Basel II which will improve risk management. The new Basel Capital Accord (Basel II) expected to be operational in Ghana beginning 01 January 2011 represents the most significant change to the supervision of banks. The focus will be on establishing how much capital a bank requires, given its risk profile and improve risk management (*PriceWaterhouseCoopers, 2009-2010*).

Many Ghanaian banks enjoy the stable economy climate. Provisional data on the banking industry for the year ending December 2010 showed that the industry's balance sheet expanded by 23.9% to GH¢17.4 billion compared with a growth of 31.3% in 2009. Domestic currency denominated assets increased by 92.4% to GH¢16.07 billion compared with 28.4% growth in 2009. The banks continue to restructure their balance sheet against the backdrop of high leverage in the financial system. The declining inflation and diminishing inflation expectation in the domestic economy culmination in an improved inflation outlook and interest rate development through 2010.

The bank's asset base represented 38.8% of GDP in 2010 compared with 38.1% of GDP in 2009. Inflation in Ghana stood at 9.1% in November 2010 eased considerably to 8.6% in December 2010 and picked up 9.1% in January 2011. The traditional core business of commercial banks in Ghana has been retail and corporate banking.

As retail and corporate banking become less and less profitable, banks are diversifying into new businesses to stop the decline of profits. The drawback is that volatility of earnings has dramatically increased. The management of these new types of risk—typically, market risk and credit risk on traded assets—requires competence and expertise. Hence, the risk of commercial bank is changing as a consequence of diversification. Banks have influenced economics and politics for centuries. Historically, the primary purpose of a bank was to provide loans to trading companies. Bank provided funds to allow businesses to purchase inventory, and collected those funds back with interest when the goods were sold
(PriceWaterhouseCoopers, 2009-2010).

In Ghana, there have been attempts to ensure efficiency, profitability and competitiveness in the banking industry. Among these initiatives were the movement to universal banking, the adoption of an open licensing system, and the modernization of the payments system, including establishing a central securities depository and the passage of supportive laws. Universal banking, which involves the removal of restrictions on banking activity, was introduced to allow banks to choose the type of banking services they would like to offer in line with their capital, risk appetite and business orientation. The purpose of this was to remove the monopoly that was given to commercial banks in the area of retail banking, and create room for diversification of the range of financial service that a bank can provide. In addition, it allowed merchant bank for example to compete for retail deposits. This process according to the central bank would lead to branch network expansion, increasing banking penetration, and also competition for deposits at the retail level. Indeed the movement

into universal banking also with a higher capital requirement to ensure that banks are sufficiently capitalized to take on additional risk (Acquah, 2006)

The Ghanaian economy registered a strong growth in 2012 despite the slowdown in the global economy. Real GDP growth was estimated at 7.9 percent compared with global growth of 3.2 percent and SSA growth of 4.8 percent. In the first half of the year, microeconomic stability was threatened by increased volatility in the foreign exchange market. However, policy measures implemented restored stability in the market.

The stance of monetary policy in 2012 was driven by the need to stabilize the exchange rate of the cedi so as to sustain the low inflation environment. In terms of specific policy measure, the monetary policy rate (MPR) was raised cumulatively by 250 basis points (bps) other measure include,

- (i) Re-introduction of the bank of Ghana bills to provide additional avenues for cedi investment.
- (ii) Reduction of the limit on the Net Open Positive (NOP) OF Deposit Money Bank (DMBs).
- (iii) Requirement for DMBs to maintain the mandatory 9.0 percent cash reserve requirement on both domestic and foreign currency deposit liabilities in cedis only.
- (iv) A 100 percent cedi cover for vostro balance to be maintained at the bank of Ghana.

The rationale for these policies was among other, to realign demand pressure in the foreign exchange market towards cedi denominated assets while augmenting the supply of foreign currencies in the market.

The pace of domestic economic activity marginally slowed down in 2015 relative to 2014, largely due to the effect of the energy sector challenges especially on industry. According to the GSS; real GDP grew by 3.9 percent compared with 4.0 percent in 2014. Inflation pressures remained elevated during the year due to pass through effects of a series of upward adjustment in utility tariffs and petroleum price as well as depreciation of the domestic currency.

Key monetary aggregates and credit to the private sector recorded slower growth in 2015. Growth in money supply including foreign currency deposits (M2+), declined to 26.1 percent from 36.8 percent in the previous year. Credit to the private sector recorded a lower growth of 30.8 percent compared with 42.6 percent in 2014.

2.4.7 National Investment Bank (NIB) Limited

The National Investment Bank (NIB) Ltd. was established as an autonomous joint state-private institution by an Act of Parliament (Act 163) on March 22, 1963. It was established primarily to promote and strengthen rapid industrialization in all sectors of the Ghanaian economy. The National Investment Bank Ltd is the first development bank in the country. It has therefore played a leading role in developing a number of highly successful industrial projects in the country, through equity and debt financing. Some of these are Nestle Ghana Ltd., Nexans Kabelmetal (Gh) Ltd., Ayensu Starch Co. Ltd., and Total Ghana Ltd (www.nib-ghana.com).

2.4.8 Universal Merchant Bank (Ghana) Limited

Universal Merchant Bank is the premier bank in the sub sector of merchant banking in

Ghana. The Bank was incorporated on 10th June, 1971 as the National Finance and Merchant Bank Ltd. It was granted license to operate banking business on 16th July, 1971. Merchant Bank opened its doors to the public on 15th March, 1972 as the premier merchant bank in Ghana. The Bank set the pace for the growth of merchant banking in the country, and thus contributed immensely to the economic development of the country over the last three decades (www.merchantbank.com.gh).

2.4.9 Ghana Commercial Bank Limited

Ghana Commercial Bank Ltd started in 1953 as the Bank of the Gold Coast to provide banking services to the emerging nation for socio-economic development. The Bank was to provide special attention to Ghanaian traders, business people and farmers who could not elicit support from the expatriate banks. In 1957, when Ghana attained independence, Bank of Ghana was established as the Central Bank while the Bank of the Gold Coast was renamed Ghana Commercial Bank to focus solely on commercial banking services. Since then GCB branches have been opened across the length and breadth of the nation tapping the potential of the 10 regions that make Ghana (www.gcb.com.gh).

2.5 Empirical Literature (Determinant of Bank Profitability)

In measuring performance, many researchers have argued for the return on assets (ROA) as against Return On Equity (ROE). According to Hassan and Bashir (2003), ROA shows the profit earned per dollar of assets and most importantly, it reflects the management's ability to utilize the bank's financial and real investment resources to

generate profits. For any bank, ROA depends on the bank's policy decision as well as on uncontrollable factors relating to the economy and government regulations.

Rivard and Thomas (1997) suggested that bank profitability is best measured by ROA in that ROA is not distorted by high equity multipliers and ROA represents a better measure of the ability of a firm to generate returns on its portfolio of assets. ROE on the other hand, reflects how effectively a bank management is in utilizing its shareholders funds. Since ROA tend to be lower for financial intermediaries, most banks heavily utilized financial leverage heavily to increase their ROE to competitive levels (Hassan and Bashir, 2003).

One can deduce from the above that in examining performance or profitability of banks and what drives it, management decision and country level policies are vital in determining how profitable a bank can be. For this matter to study the drivers of banks profitability both endogenous variable internal to the bank in question and macroeconomic variation are intrinsic and inevitable.

Several variables are used as determinants of bank profitability in studies in the banking industry. We can essentially divide bank studies into two groups based on the variables used to measure bank performance as dependent variables. On the other hand and in most studies, bank performance is measured by the level of profitability.

The profitability measured includes the Rate of Return on Equity (ROE), Rate of Return on Capital (ROC) and the Rate of Return on Assets (ROA). In most bank studies, emphasis is placed on measuring profitability in terms of ROC and ROA. Sinirlock (1985) noted that the use of ROA has provided strongest evidence on the Concentration-profitability relationship in banking.

Keeton and Matswaga (1985) asserted that ROA is especially useful in measuring changes in bank performance over time since bank's income and expense components

are more closely related to assets. Several studies of the structure performance hypothesis in the banking system have used both ROA and ROE (Civelek and Al-Alami, 1991,) and Smirlock (1985) used all the three measures.

Civelek and Al-Alami (1991) found results based on ROA to be statistically very inferior and justified the relative performance of ROE on the basis that it reflects the efforts of managers interested in maximizing shareholders wealth.

Other studies have used ROA as a measure of profitability in banking studies. The basic argument in favour of profitability measures in banking is that banks are essentially multi-products firms and the use of profitability measures eliminates problems associated with cross-subsidized between products and services.

The internal factors relate to banks' characteristics and external factors are described as the Economic and Legal Environment (Athanasoglou, Brissimis and Delis, 2008). Another study in predicting bankruptcy is by Boritz and Kennedy (1995) who examined different types of artificial neural network and compared against other bankruptcy prediction techniques such as discriminant analysis, logit and probit techniques. Performance of the artificial neural network is found to be affected by the choice of variable. Although the artificial neural network has outperformed the traditional methods, the latter has advantage of being easy to understood and use.

Multiple linear regression is a very common statistical technique used in finding the determinants of bank performance, for example Athanasoglou, Brissimis and Delis, 2008, Haron (2004) and Sanusi and Mohammed (2007). The analysis of multiple linear regressions often produced low coefficient of multiple determination, or R^2 values and the presence of outliers is seen to be a very common problem (Midi and Imon, 2006).

The performance measures are represented by Return on Deposits (ROD) from balance sheets (Sanusi and Mohammed (2007)). In a study on panel data in finding determinants of Islamic bank profitability, Haron (2004) found that internal factors such as liquidity, total expenditure, funds invested and profit sharing ratio have a significant effect on bank profitability. Interest rate, market share and bank size, described as external effects are also found to have the same effect in determining bank profitability. Sanusi and Mohammed (2007) found that bank's characteristics and the financial structure of a country are significant variables affecting bank profitability. The authors also compared the results of fixed effects and random effects on the proposed model and observed low adjusted R^2 values, indicating a low proportion of variation in profitability explained by the significant independent variable.

Athanasoglou, Brissimis and Delis, (2008) investigated the effect of bank-specific and industry-specific and macroeconomics of determinants on bank profitability in Greece. Two variables were found to have significant effect; labour productivity growth (positive effect) and operating expenses (negative effect). Variable used by

Athanasoglou, Brissimis and Delis, (2008) are adapted in this study to perform multiple linear regression on the Malaysian banks. Comparison of artificial neural network and multiple linear regressions has also been done in various field of study.

Artificial neural network is extensively being applied in predicting bankruptcy. Leshno and Spector (1996) have compared artificial neural network with multivariate discriminant analysis and logistic regression in their study on bankruptcy using a limited number of firms. Prediction capabilities of artificial neural network are found to be more accurate than the classical discriminant analysis and logistic regression. The authors also concluded that an ample number of examples must be provided for neural network to perform at its optimum.

The performance of artificial neural network has been compared with many other traditional statistical techniques. For example, artificial neural network compared with multiple linear regression (Nguyen and Cripps, 2001 and Arulsudar, Subramaniam and Murthy, 2005), discriminant analysis and logistic regression (Leshno and Spector 1996), decision trees and logistic regression (Delen, Walker and Kadam, 2001), stepwise regression and ridge regression (Chokmani, Quarda, Hamiton, Hosni and Hugo, 2008), logistic regression (Zhang, Hu, Patuwo and Indro, 1997). The artificial neural network is found to have better performance than multiple regression analysis when moderate to large data sample size is used (Nguyen and Cripps, 2001). Nguyen and Cripps (2001) examined the performance of various artificial neural network architectures. Standard Bank propagation is found to perform better than other neural network architectures. The network performance is also found to improve with training size. The application of neural network in various fields of study has showed positive and promising results. Multiple linear regressions are very popular method. Therefore, in this study, the multiple linear regressions will be used to predict the performance of banks. The results can then be of importance to predict bank performance in Ghana.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter analyzed the methodology adopted for the study.

3.2 Sampling or Selection of Banks

The selection of National investment bank, Ghana Commercial bank and Universal Merchant bank in this survey was purely as a result of the size of the banks in the Ghanaian economy, years of experience, market size and nature of business, thus the selection in this survey was on the following basis:

National Investment Banks Limited is one of the largest banks in Ghana with forty-one(41) branches; Ghana Commercial bank has also with one hundred and sixty (160) branches and Universal Merchant Bank twenty-two (28) branches throughout the country.

3.3 Data Source

This study will use data from secondary sources. Mainly, annual reports of National Investment Bank Limited, Ghana Commercial Bank and Universal Merchant Bank Limited over the period, 1991-2015. Total annual assets, equity to total asset, total annual non-interest income, total annual loan loss provisions and total annual overhead expenses was used to estimate the ratios and coefficients for the internal determinants. For the external determinants, data on GDP, money supply growth and inflation will be obtained from the Ghana Statistical Service over the period 1991-2015 and also data

on annual report, statistical bulletin from Bank of Ghana (central bank) over the period, 1991-2015.

3.4 Variables

One dependent, five independent variables (internal factors) and three independent variable (external factors).

3.4.1 Dependent variable

The dependent variable of the model is Return on Assets (ROA) similar as used in the studies of Abbasoglu et.al. (2007), Naceur and Goaid (2008), and Kosmidou (2008). ROA is the basic indicator of a bank manager's capability to make profit form bank's financial and real assets (Golin, 2001, Hassan and Bashir, 2003).

According to Rivard and Thomas (1997), ROA is the most robust variable implying bank profitability, as it is not influenced from high equity multiples and evaluates the return-generating capacity of entire assets of a bank. In the model, return on assets is denoted as ROA.

3.4.2 Independent variable

The independent variables are classified into two categories: internal determinants and external determinants. Internal determinants: these are the bank-specific variables that will be included in the regressions model, and they are LNNTA is also used to control for cost differences related to bank size and for the greater ability of larger bank to

diversify, (LLP/TL) is incorporated as an independent variable in the regression analysis as a proxy of credit risk, NII/TA (Non-interest income divided by total assets), NIE/TA (total overhead expenses divided by total assets) and finally, EQUASS (Shareholders' equity as a fraction of total assets)

External determinants: LNGDP (natural log of GDP), MSG (money supply growth rate), and INFL (inflation rate).

3.5 Model

The statistical tool that will be used to estimate the determinants of the profitability of banks or the relationship that exist between Ghana's Commercial Bank's profitability and bank specific determinants and some macroeconomic variables are ratio analysis and multiple linear regression model.

3.6 Multiple Linear Regression Model

Multiple linear regression analysis is a technique for modelling the linear relationship between two or more variables. It is one of the most widely used of all statistical methods. In banking and finance literature, regression analysis is a very common method used to find the determinants of bank performance.

Multiple Linear Regression (MLR) is one of the most commonly used data mining techniques, and can provide insightful information in cases where the rigid assumptions associated with MLR are met. The assumptions include (i) linearity of the coefficients; (ii) normal or Gaussian distribution for the response errors (ϵ); and (iii) the errors ϵ have a common distribution. MLR is a very versatile tool and can be applied to almost any process, system, or area of study. Much has been published

regarding this subject, and the following text may be useful to the reader: Kutner et al., (2004), as well as Myers (1990), provided thorough accounts of MLR and will be indispensable or most readers.

The general linear regression model, with normal error terms, simply in terms of X variables. The underlying assumptions of linearity, normality, constant variance and independence of error terms must be satisfied in order to get a more valid model. Diagnostics for the underlying assumptions must be done and remedial measures can then be taken accordingly.

3.7 Theoretical Model

To test the relationship between bank profitability and the bank specific and macroeconomic determinants, we estimate a linear regression model in the following form:

$$Y_{jt} = U_j + \Delta' X_{jt} + \beta' Z_t + \varepsilon_{jt} \quad (3.1) \text{ where } j$$

refers to an individual financial institution; t refers to year; Y_{jt} refers to the return on assets (ROA) and is the observation of financial institution j in a particular year t; X represents the internal factors (determinants) of a financial institution; Z represents the external factors (determinants) of a financial institution; ε_{jt} is a normally distributed random variable disturbance term.

The linear regression model is based on the following assumptions:

- i. Linear Functional form
- ii. Fixed independent variables. Thus apart from the fact samples are representative, there is also no Autocorrelation, and even if it exist it is insignificant.

- iii. Independent observations.
- iv. Representative sample and proper specification of the model (no omitted variables)
- v. Normality of the residuals or errors
- vi. Equality of variance of the errors (homogeneity of residual variance)
- vii. No multicollinearity, since this would limit proper parameter estimation
- viii. No autocorrelation of the errors
- ix. No outlier distortion

If the empirical model estimated violates any of the above assumption, this could lead to some difficulties or challenges. For the purpose of this study, some investigations was performed to establish the existence or otherwise of Heteroscedasticity, Multicollinearity, and Autocorrelation in the model.

3.8 Justification for the choice of variables

The LNTA variable is included in the regression as a proxy of size to capture the possible cost advantages associated with size (economies of scale). In the literature, mixed relationships are found between size and profitability, while in some cases a U-shaped relationship is observed. LNTA is also used to control for cost differences related to bank size and for the greater ability of larger bank to diversify. In essence, LNTA may have a positive effect on bank profitability if there are significant economies of scale. On the other hand, if increased diversification leads to higher risks, the variable may exhibit negative effects (Sufian and Chong. 2008).

The ratio of loan loss provisions to total loans (LLP/TL) is incorporated as an independent variable in the regression analysis as a proxy of credit risk. The coefficient of LLP/TL is expected to be negative because bad loans are expected to reduce profitability. In this direction, Miller and Noulas (1997) suggested as the exposure of the financial institutions to high risk loans increases, the accumulation of unpaid loans would increase and profitability would decrease.

Miller and Noulas (1997) suggested that decline in loan loss provisions are in many instances the primary catalyst for increases in profit margins.

Thakor (1987) put forward that the level of loan loss provisions is an indication of a bank's asset quality and signals changes in the future performance (Sufian and Chong, 2008).

To recognize that financial institutions in recent years have increasingly been generating income from off-balance sheet business and fee income general, the ratio of non-interest income over total assets (NII/TA) is entered in the regression analysis as a proxy for non-traditional activities. Non-interest income consists of commission, service charges, and fees, guarantee fees, net profit from sale of investment securities, and foreign exchange profit. The ratio is also included in the regression model as a proxy measure of bank diversification into non-traditional activities. The variable is expected to exhibit positive relationship with bank profitability (Sufian and Chong, 2008).

The ratio of overhead expenses to total assets, NIE/TA, is used to provide information on the variations of bank operating costs. The variable represents the total amount of wages and salaries as well as the costs of running branch office facilities. The relationship between the NIE/TA variable and profitability levels may be negative, as

banks that are more productive and efficient aim to minimize their operating costs. Furthermore, the usage of new electronic technology, like ATMs and other automated means of delivering services may have caused wage expenses to fall as capital is substituted for labour (Sufian and Chong. 2008).

EQASS variable is included in the regressions to examine the relationship between profitability and bank capitalization. A strong capital structure is essential for financial institutions in developing economies, since it provides additional strength to withstand financial crises and increased safety for depositors during unstable macroeconomic conditions. Furthermore, lower capital ratios in banking imply higher leverage and risk, which therefore lead to greater borrowing costs. Thus, the profitability level should be higher for the better-capitalised bank (Sufian and Chong. 2008).

In the case of the external variables, bank's profitability is sensitive to macroeconomic conditions despite the trend in the industry towards greater geographic diversification and a larger use of financial engineering techniques to manage risk associated with business cycle forecasting. Generally, higher economic growth encourages banks to lend more and permits them to charge higher margins while improving the quality of their assets. Dermiguc-Kunt and Huizinga (2001) and Bikker and Hu (2002) identified possible cyclical movements in bank profitability, i.e., the extent to which bank profits are correlated with the business cycle. Their findings suggest that such a correlation exists, although the variables used were not direct measures of the business cycle (Sufian and Chong. 2008).

It is based on the above arguments that these variables are considered; LNGDP (natural log of GDP), MSG (money supply growth), and INFL (inflation rate).

3.9 Model Diagnosis

Diagnosing the model will also be check to establish whether the estimates of the coefficients are tenable and the extent to the regression coefficients fitted in the model makes the model the best linear unbiased estimator of return to assets or profitability of the banks in Ghana. For the purpose of this study, the model will test to verify the existence or otherwise of Multicollinearity, Heteroskedasticity and Autocorrelation. The significant presence of any of this will imply a violation of three key assumptions.

3.9.1 Multicollinearity Diagnosis

To test the independence of the explanatory variables this study will used collinearity statistics with special emphasis on the analysis of Variance Inflation Factors (VIF) statistics. Literature have it that small intercorrelations among the independent variables implies that the $VIF \approx 1$. But when the $VIF > 10$, then collinearity is a problem and the model needs to be checked.

Where $VIF = 1/\text{tolerance}$, and

$\text{Tolerance} = 1 - R^2$, and $R^2 = \text{coefficient of determination}$

VIF analysis is probably the most widely used approach among other methods, such as correlation matrix, t-test of the parameter, and the condition index analysis. This is because the Variance Inflation Factors make it possible to detect multicollinearity and to measure its effects on estimate precision. However, they do not enable the user to determine which variables are mainly responsible for variance inflation.

3.9.2 Heteroskedasticity Diagnosis

To test for the presence of heteroskedasticity, the Breusch-Pagan / Cook-Weisberg tests will be employed. This test involves testing the null hypothesis that the error variances

are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. In other words the alternative hypothesis states that, error variances increase (or decrease) as the predicted values of Y increase. A large chi-square will indicate that heteroskedasticity was present, thus it indicates that the error term is a multiplicative function of the predicted values.

3.9.3 Autocorrelation Diagnosis

To test for the existence of autocorrelation or not, the Durbin Watson Test will be employed. This module tests for correlations between errors. Specifically, it tests whether adjacent residuals are correlated, which is a violation of a regression assumption that the residuals are independent. In short, this module is important for testing whether the assumption of independent errors is tenable.

Thus the Durbin-Watson Test for serial correlation assumes that the error terms (ϵ_i) are stationary and normally distributed with mean zero. It therefore tests the null hypothesis (H_0) that the errors are uncorrelated against the alternative hypothesis (H_1) that the errors are AR (1). Thus if ρ_s are the error autocorrelations, then we have $H_0: \rho_s = 0$, and $H_1: \rho_s = \rho^s$ for some nonzero with $|\rho| < 1$. To test H_0 against H_1 , we get the linear multiple regression estimates for the parameters and their corresponding Estimated errors e_1, e_2, \dots, e_n .

The test statistic can vary between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated. A value greater than 2 indicates a negative correlation between adjacent residuals whereas a value below 2 indicates a positive correlation. The size of the Durbin-Watson statistic depends upon the number of predictors in the model, and the number of observations. For accuracy, we will use the exact acceptable values

in Durbin and Watson's (1951) original paper. As a very conservative rule of thumb, Field (2009) suggests that values less than 1 or greater than 3 are definitely cause for concern; however, values closer to 2 may still be problematic depending on your sample and model.



3.9.4 Empirical Model

The empirical model to be used in the study is modelled as follows:

$$ROA_{jt} = U + \Delta_1 LLP/TL_{jt} + \Delta_2 NII/TA_{jt} + \Delta_3 NIE/TA_{jt} + \Delta_4 LN TA_{jt} + \Delta_5 EQASS_{jt} + \beta_1 LNGDP_t + \beta_2 MSG_t + \beta_3 INFL_t + \varepsilon_{jt} \dots\dots(3.2)$$

Where:

ROA_{jt} : return on assets for bank j in year t

LLP/TL_{jt} : ratio of loan loss provisions to total loans for bank j in year t

NII/TA_{jt} : ratio of non-interest income over total assets for bank j in year t

NIE/TA_{jt} : ratio of overhead expenses to total assets for bank j in year t

$LN TA_{jt}$: natural log of total assets for bank j in year t

$EQASS_{jt}$: ratio of equity to total assets for bank j in year t

$LNGDP_t$: natural log of GDP for year t

MSG_t : money supply growth for year t

$INFL_t$: annual inflation rate for year t

Based on the justification for the inclusion of the above variables in the model as espoused by the numerous researchers, a priori restrictions have been assigned to the variables. Table 1 below shows the variables and their a priori restrictions:

Hypothesis Testing

To test the null hypotheses, the null and alternative hypotheses stated formally are as follows:

Endogenous, model:

1. $H_0: \Delta_i = 0; i=1,2,3,4,5$

$H_1: \Delta_i \neq 0: \text{ otherwise}$

Exogenous model:

2. $H_0: \beta_j = 0; j = 1, 2, 3$

$H_1: \beta_j \neq 0 : \text{ otherwise}$

Both endogenous and exogenous model

3. $H_0: \Delta_i = 0; \beta_j = 0; i = 1, 2, 3, 4, 5 \ \& \ j = 1, 2, 3$

$H_1: \Delta_i \neq 0; \beta_j \neq 0: \text{ otherwise}$

The test statistics for each of the null hypothesis is as follows:

$T = \Delta_i / se (\Delta_i) \approx t_{\alpha/2, n - 1}$: thus the null distribution follows the student T distribution or

$= \beta_j / se (: \beta_j) \approx t_{\alpha/2, n - 1}$

where $se (\Delta_i) \text{ or } se (\beta_j) = SEb = S/\sqrt{n}$

$$s = \sqrt{\frac{1}{N - 1} \sum_{i=1}^N (x_i - \bar{x})^2}$$

Where s = std dev of residual

Decision Rule

If $T > t_{\alpha/2, n - 1}$; then we reject the null hypothesis and accept the alternative hypothesis that the parameter estimate or the driver in question is significant profitability of the banks. Otherwise we accept the null hypothesis that the driver is not significant

3.9.5 Test for Multicollinearity

H_0 : There is No perfect linear relationship between the explanatory variables. Thus the explanatory variables are independent.

H_1 : There is a linear relationship between the explanatory variables. Thus the explanatory variables are NOT independent.

The test uses the variable inflation factors (VIF) statistics as the test statistics, thus $VIF = 1/\text{tolerance}$, and $\text{Tolerance} = 1 - R^2$, and $R^2 = \text{coefficient of determination}$.

3.9.6 Test for Heteroskedasticity

$H_0: \text{Var}(u/x, x, \dots, x) = E(u)$

Thus we test whether the variance of the error term is constant. In other words if the null hypothesis is true then we can conclude that the model is homoscedastic and not heteroskedastic.

$H_1: \text{Var}(u/x, x, \dots, x) \neq E(u)$;

Thus if the alternative hypothesis is true we conclude that heteroskedastic, a situation that can render the model not to be BLUE.

The test statistic is as follows;

3.9.7 Test for Autocorrelation

$H_0: \rho = 0$

$H_1: \rho \neq 0$ for some nonzero ρ with $|\rho| < 1$

The test statistics for the null hypothesis is $d = \frac{\sum (e_t - e_{t-1})^2}{\sum e_t^2}$, which is the Durbin-Watson test statistics.



CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter is devoted for the analysis, discussion of results. In studying the key drivers of profitability, we evaluated the impact of some key internal and external variables on return to assets of these banks. The variables that were studied are:

The natural logarithm of the accounting value of the total assets of the bank;

- ratio of Loan loss provisions to total loans;
- ratio of non-interest income to total assets;
- ratio of non-interest expense to total assets;
- ratio of equity to total assets;
- natural logarithm of gross domestic products;
- growth of money supply as measured by currency in circulation; and Annual inflation rate.

4.2 Regression Analysis

The model as specified is a combination of both endogenous variables (LLP_TL, NII_TA, NIE_TA, EQ_ASS, and LNTA) and exogenous variables (LNGDP, MSG, and INFL). But in order to establish which of them are key drivers of the banks' profitability, the estimation of the coefficients were done in three parts such that endogenous and exogenous variables were combined, and secondly endogenous variables and exogenous variables were separated.

From Table 4.1, since the calculated is greater than the significance value it is an indication that the explanatory variables in the regression model are significant in explaining the drives profitability or the return on assets of the commercial banks in Ghana. This result cuts across all the three estimated models, such that the model would be significant whether the endogenous and exogenous variables are combined or separated. Thus the regression models are relevant in determining the major drivers of profitability among commercial banks in Ghana.

Table 4. 2: ANOVA

Both Endogenous and Exogenous

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.254	8	.0318	16.37	.021a
Residual	.128	66	.0019		
Total	.382	74			

Source: authors' compilation from the banks financial statements

a. Predictors: (Constant), money supply growth, loans loss provisions divided by total loans, natural log of GDP, total overhead expenses divided by total assets, noninterest income divided by total assets, annual inflation rate, book value of stockholders' equity as a fraction of total assets, log of total assets

Table 4.3:

Endogenous

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.179	5	.0358	20.08	.042a
	Residual	.123	69	.0018		
	Total	.302	74			

Source: authors' compilation from the banks financial statements

a. Predictors: (Constant), log of total assets, total overhead expenses divided by total assets, non-interest income divided by total assets, loans loss provisions divided by total loans, book value of stockholders' equity as a fraction of total assets

Table 4.4:

Exogenous						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.128	3	.0427	17.51	.021a
	Residual	.173	71	.0024		
	Total	.301	74			

a. Predictors: (Constant), money supply growth, natural log of GDP, annual inflation rate

Source: authors' compilation from the banks financial statements

The coefficient of determination (R-square) and the adjusted coefficient of determination which is the explanatory power of the model in the below show that, the combined model of endogenous and exogenous variables produces the highest explanatory power of at least sixty percent (0.60). Thus about sixty percent of the variability in ROA or profitability of commercial banks in Ghana can best be explained by both endogenous and exogenous variables.

From Table 4.4, when the variables are split into two (endogenous and exogenous variables) and their regression coefficients are estimated, the results indicates that the endogenous variables have a higher explanatory power than the exogenous variables. Thus the endogenous variables can best explain the variability in the profitability or ROA of commercial banks than the exogenous variables. In other words, endogenous variables are better drivers of commercial banks' profitability or ROA than the exogenous variables.

Table 4.5: Explanatory power of the Model

Model Summary		
Model	R Square	Adjusted R Square
Both Endogenous and Exogenous	0.657	0.604
Endogenous	0.594	0.557
Exogenous	0.424	0.393

Source: authors' compilation from the banks financial statements

4.3 Empirical Models

Table 4.6: General Empirical Model (Both Endogenous and Exogenous)

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	.070	.285		.244	.808
	loans loss provisions divided by total loans	-.044	.087	-.092	-.501	.618
	non-interest income divided by total assets	-.029	.128	-.050	-.226	.822
	total overhead expenses divided by total assets	.000	.094	.000	-.002	.998
	book value of stockholders' equity as a fraction of total assets	.109	.260	.104	.419	.677
	log of total assets	-.014	.017	-.222	-.807	.423

natural log of GDP	.021	.013	.433	1.655	.104
annual inflation rate	.000	.001	.078	.461	.647
money supply growth	.001	.001	.138	.916	.364
a. Dependent Variable: return on assets					

Source: authors' compilation from the banks financial statements

$$ROA = 0.070 - 0.092 * LLP_TL - 0.50 * NII_TA + 0.00 * NIE_TA + 0.104 * EQ_ASS - 0.222 * LNTA + 0.433 * LNGDP + 0.138 * MSG + 0.078 * INFL$$

Table 4.7: Separate Empirical Model

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.077	.237		-.327	.745
	loans loss provisions divided by total loans	.013	.076	.027	.169	.866
	non-interest income divided by total assets	.065	.110	.113	.589	.559
	total overhead expenses divided by total assets	-.005	.090	-.008	-.055	.956
	book value of stockholders' equity as a fraction of total assets	-.007	.249	-.007	-.029	.977
	log of total assets	.005	.011	.082	.443	.660

Exogenous

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.106	.073		-1.449	.153
	natural log of GDP	.011	.007	.227	1.606	.114

annual inflation rate	.000	.001	.066	.455	.651
money supply growth	.001	.001	.144	1.043	.302
a. Dependent Variable: return on assets					

Source: authors' compilation from the banks financial statements

4.2.1 Endogenous Empirical Model

$$ROA = -0.077 + 0.013 * LLP_TL + 0.065 * NII_TA - 0.005 * NIE_TA - 0.007 * EQ_ASS + 0.005 * LNTA$$

4.2.2 Exogenous Empirical Model

$$ROA = -0.106 + 0.011 * LNGDP + 0.000 * MSG + 0.001 * INFL$$

The coefficient of the ratio of loan loss provision to total loans (LLP_TL) variable in the regression model which is an indicator of credit risk, which measures how much a bank is provisioning in year t relative to its total loans, have a positive on profitability contrary to the initial a priori assumptions and theory for that matter. In addition this variable is not significant in explaining the variability in the return on assets of Ghanaian commercial banks, a result which is contrary to the results of Miller and Noulas (1997), but is in agreement with Thakor (1987) who were both cited by Sufian and Chong, (2008), who suggested that the level of loan loss provisions is an indication of a bank's asset quality and signals changes in the future performance. This result has not been any different when the model was split into only endogenous and exogenous variables, producing endogenous models, since the a priori signs are the same irrespective of the model used, as the results has shown that internally, ratio of loan loss provision to total loans is not

a key driver of profitability among Commercial Banks in Ghana. The ratio of non-interest income to total assets (NII/TA), a measure of diversification and business mix have a positive on profitability, which was in agreement with the priori restrictions. In addition this variable was statistically significant in explaining the variability in ROA of commercial banks in Ghana. Thus NII/TA is vital driver in the performance of Commercial banks in Ghana. This indicator which is a proxy for the bank's non-traditional activities is a relevant driver for performance of commercial banks in Ghana. Splitting the model into models of internal (endogenous) and external (exogenous) factors, the result indicates that the expected signs are the same irrespective of the model estimated, and that in all cases the ratio of non-interest to total assets are statistically significant in explaining the variability in ROA when internal factors alone are considered.

The ratio of non-interest expense to total assets (NIE_TA), which provides information on the efficiency of the management regarding expenses relative to the assets in year, did not only have a negative impact on profitability and thus conformed to the a priori restrictions, but was also a significant driver of commercial banks in Ghana's profitability. This shows that minimizing commercial banks in Ghana operating costs would indeed improve on the banks performance, which conforms to Bourke, (1989) cited by Sufien et al. (2008), who asserts that there is a negative relationship between the operating expenses ratio and profitability. Sufien et al., (2008), in their work on the Philippines banks also deduces that NIE_TA exhibits a negative and significant impact on Philippines banks' profitability. The results imply that an increase (decrease) in these expenses reduces (increases) the profits of financial institutions operating in the Philippines. Our study reveals that in Ghana

the ratio of non-interest expense to total assets exhibits a negative and significant impact on the ROA even when the model uses internal (endogenous) factors exclusively, thus in all cases, the ratio of non-interest expense to total assets are statistically significant in explaining the variability in ROA of Commercial Banks.

The measure of bank's capital strength in year, which is the ratio equity to total assets (EQ_ASS) has positive impact on profitability and is in line with the a priori restrictions. EQ_ASS is also significant, therefore can be considered as a good driver for performance among commercial banks in Ghana. This outcome is in line with other researchers such as Berger (1995) and Molyneux (1993), whose outcome revealed that leverage or capitalization is important in explaining the performance of financial institutions, and that its impact on bank profitability is ambiguous, and also that higher levels of equity would decrease the cost of capital, leading to a positive impact on bank profitability. Indeed the positive relationship between ROA and equity was established when only endogenous variables are considered, and EQ_ASS is also significant when considering the internal drivers of the Commercial Banks 'profits in Ghana.

The natural log of total assets (LNTA) has a positive impact on profitability and conforms to the a priori restriction. It is statistically significant in the model and like EQ_ASS it is a vital parameter and a significant driver in banks performance. This result agrees with Sufien et al., (2008) that LNTA is a variable that measures bank size and is generally used to capture potential economies or diseconomies of scale in the banking sector. Indeed their results on the banks in the Philippines showed that impact of bank size was negatively related to the profitability of Philippines banks, indicating a negative relationship between bank profitability and bank size. Just like the other variables, the size of the Commercial Banks which

was hitherto significant when both internal (endogenous) and external (exogenous) factors were combined, is still significant when the variables were split into endogenous and exogenous, and is negatively related ROA when endogenous variables alone are exclusively considered.

The impact of natural logarithm of gross domestic products (LNGDP) on profitability was positive and conforms to the a priori restrictions, but is an insignificant driver in the performance of commercial banks in Ghana. This finding even though defies logic and does not conform with earlier findings by Sufien et al., (2008), which agrees on the positive association between economic growth and the performance of the financial sector, other research findings such by valentine Flamini et al. (2009) which points to a nonexistence between size of economy and profitability of banks as they indicated that banks in Sub-Saharan African performed better in 2006 than their counterparts in high income countries. All things being equal, the growth of the economy should have a bearing on not only firms in the financial sector but also firms in the non-financial institutions such as banks. This is because during boom periods in the business cycle of Ghana it is expected that firms could borrow very huge funds for investment, and this could mean banks creating more wealth, and increasing their asset portfolio through the increase in loans provision. Splitting the model into both endogenous and exogenous variables, the size of the economy is not a key driver in determining profit among the exogenous variables among Commercial Banks in Ghana.

The Growth of Money Supply (MSG) as measured by currency in circulation has a positive impact on profitability as expected and has been a significant driver in the Performance of commercial banks in Ghana. Increasing the amount of money in circulation would imply commercial banks in Ghana having access to these funds and having the opportunity to create money and wealth. Considering the external factors alone, the growth of money supply is a significant profit driver of Commercial Banks in Ghana, and is positively related to ROA of the Banks.

The results from the study reveals that annual rate of inflation has a positive impact on profitability, and very significant driver in the performance of commercial banks in Ghana. The annual inflation rate (INFL) in Ghana is the prime data used in the determination of the central bank's lending rates to the commercial banks in Ghana. Thus the higher the rate of inflation, the higher the prime rate at which the central bank borrows to the commercial banks, since inflation in Ghana has been touted by the by central bank as been more of monetary issue than a fiscal issue, the fight against higher inflation rates are normally done using monetary policies that seeks to minimize money supply. Inflation, an exogenous variable is again a key driver of profits among Commercial Banks in Ghana, when exogenous variables are considered exclusively in the model, and it is positively related to ROA as expected.

4.4 Model Diagnosis

The fact that the data was used was a times series cross section data, it is likely to have been affected by the presence of Multicollinearity, Heteroskedasticity, and Autocorrelation. The significant presence of any of this is likely to bias the estimators,

thus the coefficients are no longer BLUE (best linear unbiased estimators) since the estimated coefficients are likely to have errors in some cases. However the significance of the presence of these noises would mean that some assumptions underlying the model have been violated.

4.5 Multicollinearity Diagnosis

The correlation matrix in table and below exhibits the extent to which the independent variables relate to each other. Indeed by the independent variables (The natural logarithm of the accounting value of the total assets of the bank; ratio of Loan loss provisions to total loans; ratio of non-interest income to total assets; ratio of non-interest expense to total assets; ratio of equity to total assets; natural logarithm of gross domestic products; growth of money supply as measured by currency in circulation; and annual inflation rate) are in themselves are not supposed to be dependent on each other or statistically relate to each other.

What can be observed from the tables 7 that, while variables such as log of assets is not statistically significantly correlated with any of the independent variables at 5% level of significance others are correlated, and may also be not correlated at 10% level of significance. An indication that multicollinearity is significant only with one explanatory variable, and this results does not matter whether the model involves both endogenous and exogenous variables and it involves on exogenous or only endogenous variables.

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Results from the VIF Table 4.7 , suggests that though multicollinearity is presence and is significant for log of asset, by the benchmark that has been set, since the VIF is not greater than 10 for any of the explanatory variables irrespective of whether multicollinearity was significant, it is not serious and may be ignored. Indeed the significant of the presence of multicollinearity with log of assets is excusable since the assets of the banks were used as denominators for some endogenous variables.

Table 4.6: Correlation Matrix 1

		loans provisions divided by total loans	loss non-interest income divided by total assets	total overhead expenses divided by total assets	book value of stockholders' equity as a fraction of total assets	log of total assets	natural log of total GDP	annual inflation rate	money supply growth
loans provisions divided by total loans	Pearson Correlation	1	.362**	.068	.502**	-.453**	-.049	-.128	.111
	Sig. (2-tailed)		.005	.607	.000	.000	.711	.331	.397
	Sum of Squares and Cross-products	1.366	.406	.066	.311	-4.718	-0.636	-16.343	10.622
	Covariance	.023	.007	.001	.005	-.080	-.011	-.277	.180

	N	75	75	75	75	75	75	75	75
non-interest income divided	Pearson Correlation	.362**	1	.124	.676**	-.288*	.011	.290*	.176

by total assets	Sig. (2-tailed)	.005		.345	.000	.026	.932	.025	.179
	Sum of Squares and Cross-products	.406	.922	.100	.344	-2.468	.121	30.477	13.799
	Covariance	.007	.016	.002	.006	-.042	-.002	.517	.234
total overhead expenses divided by total assets	Pearson Correlation	.068	.124	1	.046	-.011	.122	-.070	-.254
	Sig. (2-tailed)	.607	.345		.725	.933	.352	.596	.050
	Sum of Squares and Cross-products	.066	.100	.703	.021	-.083	1.146	-6.403	-17.489
	Covariance	.001	.002	.012	.000	-.001	.019	-.109	-.295
	N	75	75	75	75	75	75	75	75
book value of stockholders'	Pearson Correlation	.502**	.676**	.046	1	-.634**	-.399**	.182	.131
	Sig. (2-tailed)	.000	.000	.725		.000	.001	.153	.307

equity as a fraction of total assets	Sum of Squares and Cross-products	.311	.344	.021	.281	-2.994	-2.405	9.770	8.853
	Covariance	.005	.006	.000	.005	-.051	-.041	.166	.150
	N	75	75	75	75	75	75	75	75
log of total assets	Pearson Correlation	-.453**	-.288*	-.011	-.634**	1	.745**	-.237*	-.219
	Sig. (2-tailed)	.000	.026	.933	.000		.000	.068	.092

natural log of GDP	Sum of Squares and Cross-products	-4.718	-2.468	-.083	-2.994	79.513	74.172	-231.197	-159.628
	Covariance	-.080	-.042	-.001	-.051	1.348	1.257	-3.919	-2.706
	N	75	75	75	75	75	75	75	75
	Pearson Correlation	-.049	.011	.112	-.406**	.745**	1	-.377**	-.235
	Sig. (2-tailed)	.711	.932	.352	.001	.000		.003	.070
	Sum of Squares and Cross-products	-0.636	.121	1.146	-2.405	74.172	124.744	-460.329	-214.523
Covariance	-.011	-.002	.019	-.041	1.257	2.114	-7.802	-3.636	

	N	75	75	75	75	75	75	75	75
annual inflation rate	Pearson Correlation	-.128	.290*	-.070	.169	-.237*	-.377**	1	.325
	Sig. (2-tailed)	.331	.025	.596	.198	.068	.003		.011
	Sum of Squares and Cross-products	-16.343	30.477	-6.403	9.770	-231.197	-460.329	11976.034	2908.577
	Covariance	-.277	.517	-.109	.166	-3.919	-7.802	202.984	49.298
	N	75	75	75	75	75	75	75	75
money supply growth	Pearson Correlation	.110	.176	-.254	.205	-.219	-.235	.325	1
	Sig. (2-tailed)	.397	.179	.050	.117	.092	.070	.011	
	Sum of Squares and Cross-products	10.622	13.799	-17.419	8.853	-159.628	-214.523	2908.577	6667.422
	Covariance	.180	.234	-.295	.150	-2.706	-3.636	49.298	113.007
	N	75	75	75	75	75	75	75	75

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Source: authors' compilation from the banks financial statements

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

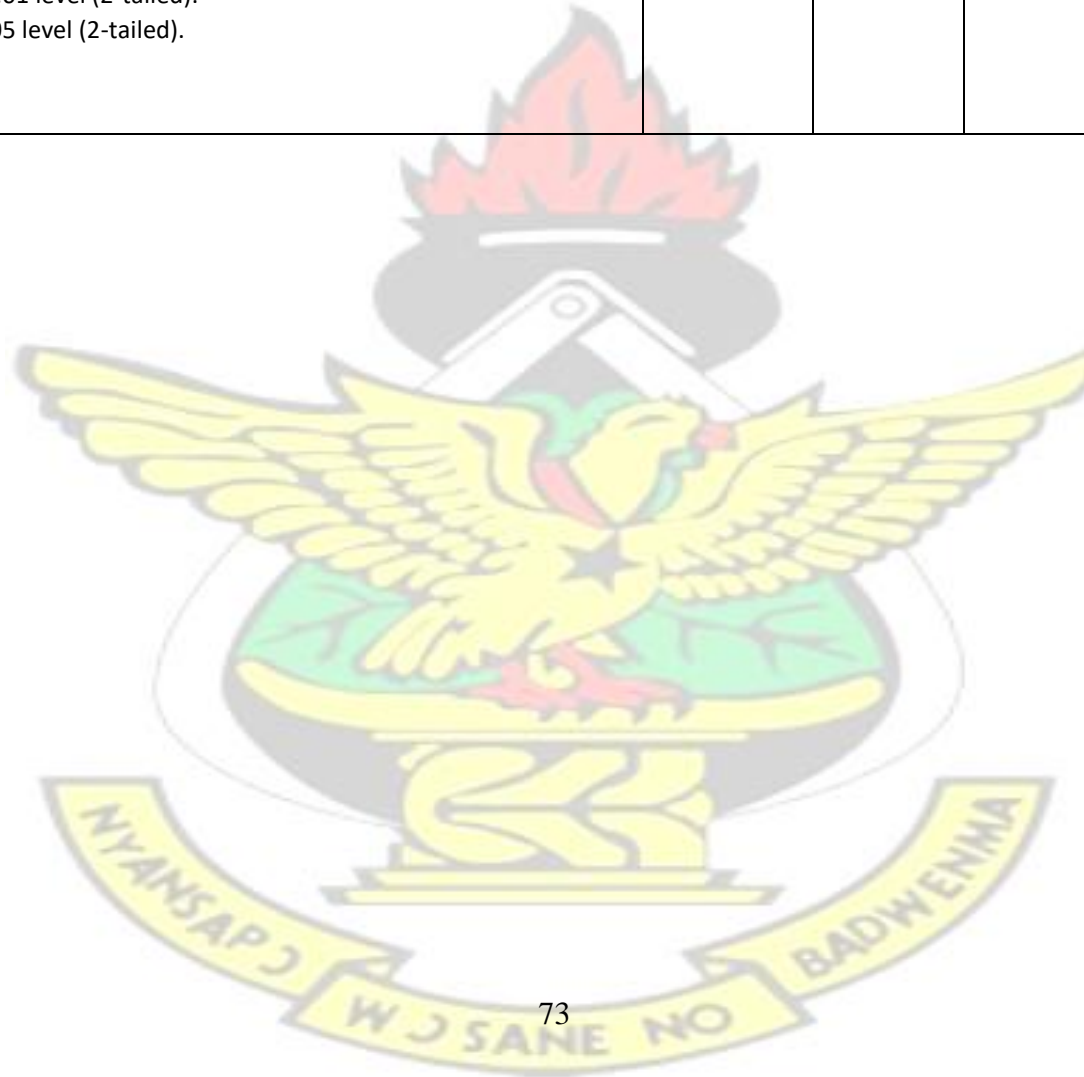


Table 4.7: Variable Inflation Factor (VIF)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
Both Endogenous and Exogenous								
1	(Constant)	.070	.285		.244	.808		
	loans loss provisions divided by total loans	-.044	.087	-.092	-.501	.618	.536	1.867
	non-interest income divided by total assets	-.029	.128	-.050	-.226	.822	.367	2.724
	total overhead expenses divided by total assets	.000	.094	.000	-.002	.998	.890	1.124
	book value of stockholders' equity as a fraction of total assets	.109	.260	.104	.419	.677	.291	3.439
	log of total assets	-.014	.017	-.222	-.807	.423	.239	4.103
	natural log of GDP	.021	.013	.433	1.655	.104	.264	3.782
	annual inflation rate	.000	.001	.078	.461	.647	.627	1.594
	money supply growth	.001	.001	.138	.916	.364	.800	1.250
Endogenous								
1	(Constant)	-.077	.237		-.327	.745		
	loans loss provisions divided by total loans	.013	.076	.027	.169	.866	.711	1.407
	non-interest income divided by total assets	.065	.110	.113	.589	.559	.499	2003
	total overhead expenses divided by total assets	-.005	.090	-.008	-.055	.956	.980	1021
	book value of stockholders' equity as a fraction of total assets	-.007	.249	-.007	-.029	.977	.321	3.115
	log of total assets	.005	.011	.082	.443	.660	.536	1.867
Exogenous								

		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.106	.073		-1.449	.153		
	natural log of GDP	.011	.007	.227	1.606	.114	.844	1.185
	annual inflation rate	.000	.001	.066	.455	.651	.799	1.252
	money supply growth	.001	.001	.144	1.043	.302	.879	1.137

a. Dependent Variable: return on assets

Source: authors' compilation from the banks financial statements Table 4.8:

Correlation Matrix 2

	LLP_TL	NII_TA	NIE_TA	EQ_ASS	LNTA	LNGDP	MSG	INFL
LLP_TL	1							
NII_TA	0.362	1						
NIE_TA	0.068	0.124	1					
EQ_ASS	0.502	0.676	0.046	1				
LNTA	-0.453	-0.288	-0.011	-0.634	1			
LNGDP	-0.049	0.011	0.112	-0.406	0.745	1		
MSG	-0.128	0.290	-0.070	0.169	-0.237	-0.377	1	
INFL	0.110	0.176	-0.254	0.205	-0.219	-0.235	0.325	1

Source: authors' compilation from the banks financial statement

4.6 Heteroskedasticity

Diagnosing the presence or otherwise of heteroskedasticity in the model, we used Breusch-Pagan/Cook-Weisberg test to verify the existence or otherwise of heteroskedasticity in the model. In this model large values of chi-square would indicate the significant presence of heteroskedasticity in the model. At 5% level of significance, the P-value in table shows that heteroskedasticity is significant in the model, thus the error of the model are a multiplicative function of the predicted values. In this model, we tested the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables.

Table 4.9: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Source	ss	Df	ms	# OF OBS=	75
				F(8,66)	4.73
Model	481.52	8	60.19	Prob>F	0.000
Residual	840.28	66	12.73	R-squared	0.3703
				Adj R -square	0.2716
Total	1321.8	74	72.92	Root MSE	3.962

Source: authors' compilation from the banks financial statements

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of ROA

chi2 (1) = 96.72

Prob>chi2 = 0.0000

4.7 Autocorrelation

From Table 4.10, the Durbin-Watson test statistics reveals that all the models (Exogenous and Endogenous, Endogenous and Exogenous models) produced values below 2 but greater than 1, which is an indication that all the models indicates a positive correlation, but according to the rule of thumb as suggested by Field (2009), values less than 1 or greater than 3 are definitely cause for concern; however, values closer to 2 may still be problematic depending on your sample and model.

From Field's rule of thumb, we conclude that autocorrelation is not too serious in any of the three models (Exogenous and Endogenous, Endogenous and Exogenous models) used in the study.

Table4.10: Durbin – Watson statistics for Autocorrelation

Category of Model	DW Statistics
Both Endogenous and Exogenous	1.079
Endogenous	1.007
Exogenous	1.058

Source: authors' compilation from the banks financial statements



CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, which is the final chapter of the study, we shall put forward a summary of the findings, conclusions and recommendations of the study.

5.2 Findings

The findings are as follows:

Regression results seem to suggest that bank size and performance are statistically insignificant. This means that size does not matter in terms of profit and that what matters is equity (tier one capital i.e. shareholders' funds).

The improvement in the quality of the loan portfolio was largely due to the expansion in the credit base of the banking industry as a result of reduction in reserve requirement.

Staff Cost and infrastructural cost (technology) are the main sources of high operating costs.

5.3 Conclusions

The main conclusion of the study, is that banks in Ghana appear to behave in a non-competitive manner that could hamper financial intermediation. High profitability of banks in Ghana due to the wider interest rate spread account for this uncompetitive behavior of banks. Two other key conclusions from this research are: Bank size in terms of assets growth and profit performance are statistically insignificant at 5% level of significant and that size does not matter in profit performance. It is rather growth in equity which matter for profit performance. The

results of this research underline the utmost importance of bank soundness rather than asset size, for sustainable bank performance. The results clearly confirm the relevance of individual bank characteristics for profit growth.

5.4 Policy Recommendations

Based on above findings and conclusions we recommend the following as a policy for banks' strategic direction:

The need to sustain and deepen the current government fiscal prudence so as to bring down interest rates and reduce banks' spread in Ghana.

The need to reduce the transaction cost (particularly staff cost and investment cost-telecommunication).

Addressing the occurrence of losses on the loan portfolio particularly in the local Banks. Macroeconomic stability is essential for the development of the banking industry in general but more important to the individual Banks are the improvement in their credit risk and operational risk management. This is a key lesson for banks particularly, locally owned banks.

Encouraging the development of compatible IT infrastructure so that banks can pool resources and lower technological cost in the industry to enhance efficiency. There is the need for promotion and development of savings culture. This calls the introduction of innovative and attractive products and stepping up savings mobilization drive as well as ensuring confidence and credibility in the banking system to attract prospective depositors.

Entrenched to reduce the cost of banking services and increase competition.

There is the need for consolidation and mergers particularly among the small banks to expand their capital base in order to make them stronger and competitive.

Finally, the explanatory power which renders the combine endogenous and exogenous variable far more important in explaining the variability in ROA for Commercial Banks in Ghana that they cannot ignore the macroeconomic indicators when strategizing to improve on their profits or performance. Thus banks in Ghana should not only be concerned about internal structures and policies, but they must consider both the internal environment and the macroeconomic environment together in fashioning out strategies to improve their performance or profits.



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Glossary Of Key Financial Terms, Equations And Ratios

Capital adequacy ratio is the ratio of adjusted equity base to risk adjusted asset base as required by the Bank of Ghana (BoG)

Cash assets includes cash on hand, balances with the central bank, money at call or short notice, and cheques in course of collection and clearing

Cash ratio = $(\text{Total cash assets} + \text{Total liquid assets}) / (\text{Total assets} - \text{Net book value of fixed assets} - \text{Investments in subsidiaries and associated companies})$
Cash tax rate = $\text{Actual tax paid} / \text{Net operating income}$

Cost income ratio = Non-interest operating expenses / Operating income

Current ratio = (Total assets - Net book value of fixed assets - Investments in subsidiaries and associated companies) / (Total liabilities - Long term borrowings)

Dividend payout ratio = Proposed dividends / Net profit

Dividend per share = Proposed dividends / Number of ordinary shares outstanding

Earnings per share = After tax profits before proposed profits / Number of ordinary shares outstanding
Financial leverage ratio = Total assets / common equity

Liquid assets includes cash assets and assets that are relatively easier to convert to cash, e.g., investments in government securities, quoted and unquoted debt and equity investments, equity
Loan loss provisions = (General and specific provisions for bad debts + Interest in suspense) / Gross loans and advances

Loan portfolio profitability = (Interest income attributable to advances - Provisions for bad and doubtful loans) / Net loans and advances
Loan loss rate = Bad debt provisions / Average operating assets

Net book value per share = Total shareholder's funds / Number of ordinary shares outstanding

Net interest income = Total interest income - Total interest expense

Net interest margin = Net interest income / Average operating assets

Net operating income = Total operating income - Total non-interest operating expenses
+ Depreciation and amortisation - Loan loss adjustment + Exceptional
credits

Net operating (or intermediation) margin = [(Total interest income + Total noninterest
operating revenue) / Total operating assets] - [Total interest expense / Total interest-
bearing Net profit = Profit before tax - Income tax expense

Net spread = (Interest income from advances / Net loans and advances) - (Interest
expense on deposits / Total deposits)

Non-interest operating expenses include employee related expenses , occupancy
charges or rent, depreciation and amortisation, directors emoluments, fees for
professional advice and Non-interest operating revenue includes commissions and
fees, profit on exchange, dividends from investments and other non-interest investment
income, and bank and service charges Non-operating assets comprises net book value
of fixed assets (e.g., landed property, information technology infrastructure, furniture
and equipment, vehicles) and other assets, including Operating assets include cash
and liquid assets, loans and advances, and any other asset that directly generates
interest or fee income

Operating income = Net interest income + Non-interest operating revenue

Profit after tax margin = Profit after tax / Total operating income

Profit before tax margin = Profit after extraordinary items but before tax / Total operating income

Quick (acid test) ratio = (Total cash assets + Total liquid assets) / (Total liabilities - Long term borrowings)

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Return on assets = Profit after tax / Average total assets

Return on equity = Profit after tax / Average total shareholders' funds

Shareholder funds comprise paid-up stated capital, income surplus, statutory reserves, capital surplus or revaluation reserves

Total assets = Total operating assets + Total non-operating assets

Total debt ratio = Total liabilities / Total asset



KNUST

92



KNUST

93

