

# **THE DETERMINANT OF PROFITABILITY OF BANKS IN GHANA**

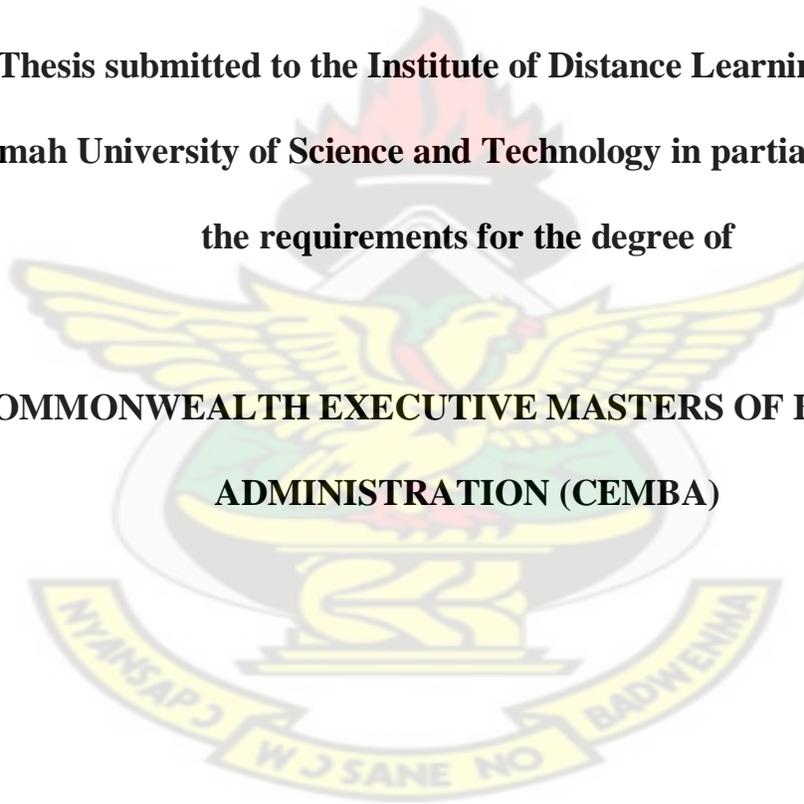
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the requirements for the degree of**

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## DECLARATION

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

# KNUST

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## DEDICATION

I dedicate this work to the Lord Jesus Christ who gives me strength to do all things and to my sister, Ms Laura Kutsienyo of blessed memory who had been a source of inspiration but did not live long enough to see this work.

# KNUST



## ABSTRACT

This study examines the determinants of bank profitability in Ghana. These determinants have been categorized into internal factors which are bank-specific characteristics and external factors which can further be divided into macroeconomic factors and financial structure factors. The main objectives of the study are to determine the factors that influence commercial banks profitability in Ghana and to make recommendations for management decision making and policy objectives. A panel data of 26 commercial banks in Ghana was analysed over a period of 2000-2009, using a generalised least squares technique to estimate fixed effect regression models. Two key measures of profitability (dependent variables) analysed in this study comprised of Return on Average Asset (ROA) and Return on Average Equity (ROE). Bank-specific factors, which were incorporated into the regression models were capital adequacy, operating expense, liquidity, asset quality, and bank size. In addition, macroeconomic factors and financial structure factors captured in the regression models included inflation, Gross Domestic Products (GDP), money supply and banking industry concentration.

The results for the ROA model indicate that capital adequacy, liquidity and bank size are positively significant to bank profitability while asset quality and operating expense are negatively significant to bank profitability. Moreover, inflation and GDP were positively significant to bank profitability while money supply and bank concentration were negatively significant to bank profitability. Apart from GDP, banking industry concentration, and asset quality, all the determinants were consistent when bank profitability was measured by Return on Equity (ROE). However, capital adequacy was negatively significant to bank profitability in the case of ROE.

## ACKNOWLEDGEMENT

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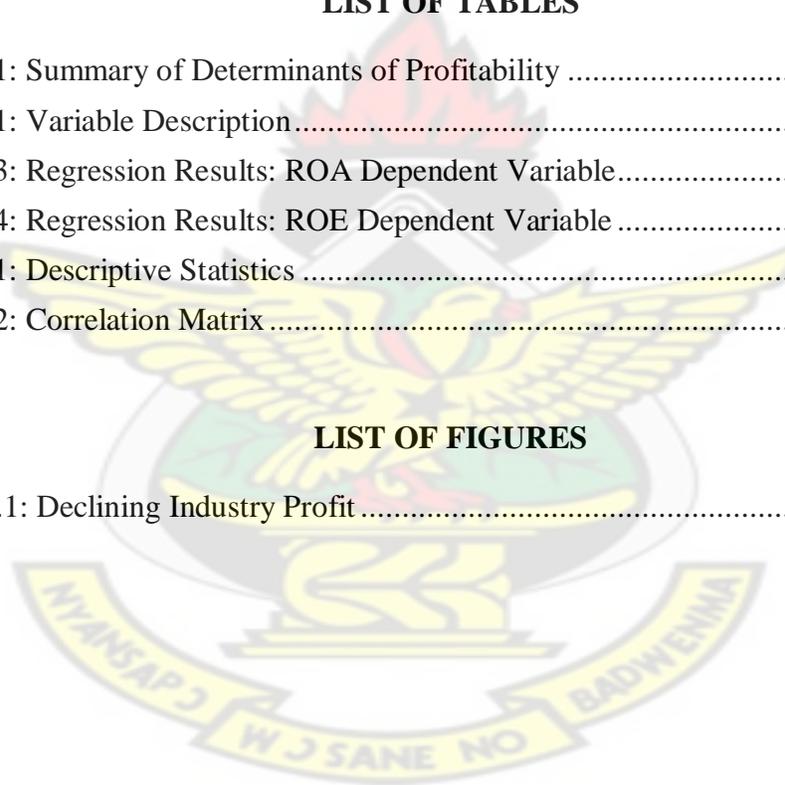
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## CHAPTER ONE

### INTRODUCTION

#### 1.0 Introduction

Financial Institutions play a crucial role in economic development and growth. The existence of Bank Financial Institutions and Non-Bank Financial Institutions, supported by efficient money and capital market keeps the financial system complete, while enhancing the overall growth of the economy. Financial institutions play the role of financial intermediation by collecting and mobilising resources to finance business and development projects that are essential for economic development. An efficient financial system is a prerequisite for proper financial intermediation leading to sustainable private sector investment and the promotion of entrepreneurship. As such, an understanding of the determinants of the profitability of financial institutions such as the banks is essential and crucial to the stability of the economy.

Although the financial system incorporates a broad range of institutions which can be categorised into bank and non-bank financial institutions, the banking system dominates. As at 2008, the Banking system in Ghana accounted for 70 percent of the financial sector (Bawumia *et al.*, 2008). This makes the commercial banking sector critical to the development of the economy as failure of this sector could have adverse systemic effect on the entire economy. In this study, the term 'bank profitability' would be used to refer to commercial bank profitability.

The Ghana banking sector has witnessed many reforms and restructuring over the years as a result of internal and external economic developments and shocks. Recent developments in the banking sector are the adoption of International Financial Reporting Standards (IFRS) in line with international standards by Bank of Ghana as a way of reducing

systemic risk. Other developments include the establishment of Collateral Registry and Credit Reference Bureaus that seeks to promote transparency and ease credit accessibility, the setting up of the Financial Intelligence Centre (FIC) to address money laundering and counter financing for terrorism, and the recapitalisation of the banks required by Bank of Ghana. All these measures by Bank of Ghana are believed to have been fashioned to mitigate risk and stabilise the banking system. These reforms are backed by tighter and effective supervisory oversight to ensure financial stability and soundness of the financial system. Banking sector reforms have changed the Ghana banking industry outlook. These well sequence financial sector reforms have been driven by banking sector liberalisation, enhanced competition, and gradual capital account liberalization (Bawumia *et al.*, 2008). It is therefore reasonable to assume that these reforms have changed the way commercial banks in Ghana operate and subsequently, their performance.

Due to the changing banking environment, profitability which is one of the most important criteria to measure performance of banks has come under intense pressure. Profitability is critical to the survival of commercial banks. Firstly, dividends are paid from profits (cash profits) and secondly, profit is an important source of retained earnings. Retained earnings are residual profits after dividends are paid. These earnings are important component of bank capital.

The relevance of the study on the profitability of commercial banks therefore is based on the fact that it is the largest sector in the banking industry. Thus, failure in the banking system may have deep economic repercussion for the economy at large. Secondly, banking sector reforms are likely to affect the way banks operate and thus their performance. Finally, bank profitability is an important source of retained earnings; a very important component of

bank capitalisation, providing a margin of protection during recessionary periods, and enabling the banks to be more resilient against external shocks.

According to the Ghana Banking Survey 2010 (by PricewaterhouseCoopers in collaboration with Ghana Association of Bankers), industry profits show a declining trend in recent years despite increase in deposits and branch network. The increase in deposits is expected to enable the banks to lend more and make more profit through interest income. However, asset quality has been on the decline increasing industry impairment charge for loan. The increased branch network is expected to lead to some efficiencies and especially economies of scale. Indeed if the size is inducing some efficiency, it should impact on profit by reducing the operating cost. The industry is quite concentrated despite the entry of eight foreign banks over the last five years. Five out of twenty-six banks account for more than 51% of the industry total deposits. While market power could lead to near monopoly profit it could also imply some inefficiency in the provision of financial services.

The high risk nature of the industry may be posing a natural barrier to entry so that industry profit is preserved. However, on the contrary we see new entrants and profits declining. It is clear that the banking sector environment has become very complex, more competitive and more challenging to the manager. In the context of rapid domestic economic and financial sector transformations, an efficient management of banking operations aimed at ensuring growth in profits and efficiency requires up-to-date knowledge of all those factors that influence the profitability of banks.

In this study, an attempt will be made to investigate some key determinants of profitability and the extent to which they impact on profitability of commercial banks. The analysis will adopt a multivariate regression model based on data pooled from annual financial

statements of 26 banks over the period 2000-2009, and macroeconomic and industry data on GDP, inflation, banking industry concentration, and money supply for the same period.

The motivation for this study is to develop a set of recommendations that could prove useful for management decision making and policy objectives in commercial banks by examining factors that impact on profitability of commercial banks and the extent to which profits of banks are influenced by these factors. These recommendations would not only prove useful in Ghana, but also in other medium size economies in the Sub-Saharan Region.

### **1.1 Background of Ghanaian Banking Industry**

The Ghanaian banking industry is relatively small consisting of 27 banks as of May, 2011. Of this number, fourteen are foreign banks (banks with foreign majority ownership) and thirteen local banks (banks with local majority owner). The banking system is based on the concept of universal banking where banks can offer all banking services. Some specialized banks have sprung up in the past only to be metamorphosed into universal banks.

The banking sector has witnessed many reforms. Prior to the reforms, there has been an extensive post-independence government intervention. Public ownership characterised the banking systems. All the banks that were set up between the early 1950 to the late 1980 were either wholly or majority-owned by the public sector. Interest rates were centrally controlled by the Monetary Authority (Bank of Ghana) and there were restrictions on sectorial credit allocation. According to Brownbridge *et al.*, (1996), Financial Sector policies were characterised by severe financial repressions, real interest rates were steeply negative and most of the credit was channelled to the public sector. This triggered a series of reforms which

included the liberalisation of allocative controls on banks, restructuring of insolvent banks and reforms to prudential regulation and supervision.

Thus, as part of a comprehensive macroeconomic adjustment programme, financial sector liberalization in Ghana was initiated in the early 1990s, under the Financial Sector Adjustment Programme (FINSAP). The effect of financial sector reform was to free the financial system from excessive government regulation in order to foster a free market-base system. The programme set prices right, initiated structural reforms, including fiscal and monetary operations. The regulatory framework was improved and bank supervision strengthened. The programme also led to the restructuring of distressed banks and cleaning up the non-performing loans in banks balance sheet.

The post-reform period has witnessed major transformation in the financial system. The institutional structure of the financial system has become more deepened and diversified. The banking sector in particular, has witnessed immense developments which include an increase in the entry of private banks (including foreign banks) into the market, and the expanded use of branches by the existing and new banks. Notwithstanding the natural barriers to entry which may exist due to tight regulation, risk, and capitalization requirements, the banking industry has witnessed the entry of eight banks from the sub-region and Asia in the last five years. That accounts for 42% growth in the number of banks in the industry over the period. In operation within the financial system are a significant number of insurance companies, a vibrant stock market and an ever-increasing number of non-bank financial intermediaries.

The financial system also operates in a legal and regulatory framework. These frameworks define the legal and regulatory environment in which banks operate. We shall not delve into

the legal and regulatory environment but it is worth mentioning that the Constitution of the Republic of Ghana and the following Acts define the regulatory system of the financial system.

- The Constitution of Ghana 1992
- The Bank of Ghana Act, 2002 (Act 612)
- The Banking (Amendment) Act 2007 (Act 378)
- The Non-Bank Financial Institution Act 2008 (Act 774)
- The Securities Industry Act 1993 (Act 333)
- The Central Securities Depository Act 2007 (Act 733)
- The Insurance Act 2006 (Act 724)
- The Companies Act, 1963 (Act 179)

The phenomenal growth in the industry, coupled with expansion in branch network, and re-injection of capital across the spectrum of the industry have not succeeded in reducing the high interest rates. The industry still operates in a high interest rate regime despite attempts by Bank of Ghana in reducing the policy rate to which the interest rates have been pegged. Commercial banks are expected to change their lending rates in response to change in the policy rate by the Monetary Policy Committee of Bank of Ghana. The high interest rate may account for the business and financial risk, market power or inefficient management in the sector. An empirical study may help answer these questions.

The capital re-injection may improve the margin of protection for risk absorption. However, new regulation would continue to add to the complexity of the business environment. The new Basel Capital Accord (Basel II) which is expected to be operational in 2011 will constitute the most significant change to banking supervision. Under the Basel II Accord, a bank's capital requirement will be based on their risk profile.

According to the Ghana Banking Survey 2010 by PricewaterhouseCoopers in collaboration with Ghana Association of Bankers, Ghana Commercial Bank Ltd. has remained the industry leader in terms of total assets over the last ten years but only toppled by Barclays Bank Ghana Ltd. in 2007 after its nationwide expansion in branch network. Ghana Commercial Bank Ltd., Barclays Bank Ghana Ltd., Standard Chartered Bank Ghana Ltd., Ecobank Ghana Ltd., and Agricultural Development Bank Ltd., control more than 50% of the total market share in terms of total assets. It is therefore obvious that the industry is a highly concentrated one.

The largest banks are not necessarily the most profitable. Although the industry profits, when measured in terms of return on shareholders' fund have remained high, it exhibit a declining trend. According to the 2010 Banking Survey, Standard Chartered Bank Ltd., appears to be consistent in bringing high returns to shareholders. The industry return on equity dropped from 22% in 2008 to 12.1% in 2009 (Ghana Banking Survey 2010). This is possibly as a result of the recapitalization requirements and a general decline in profits.

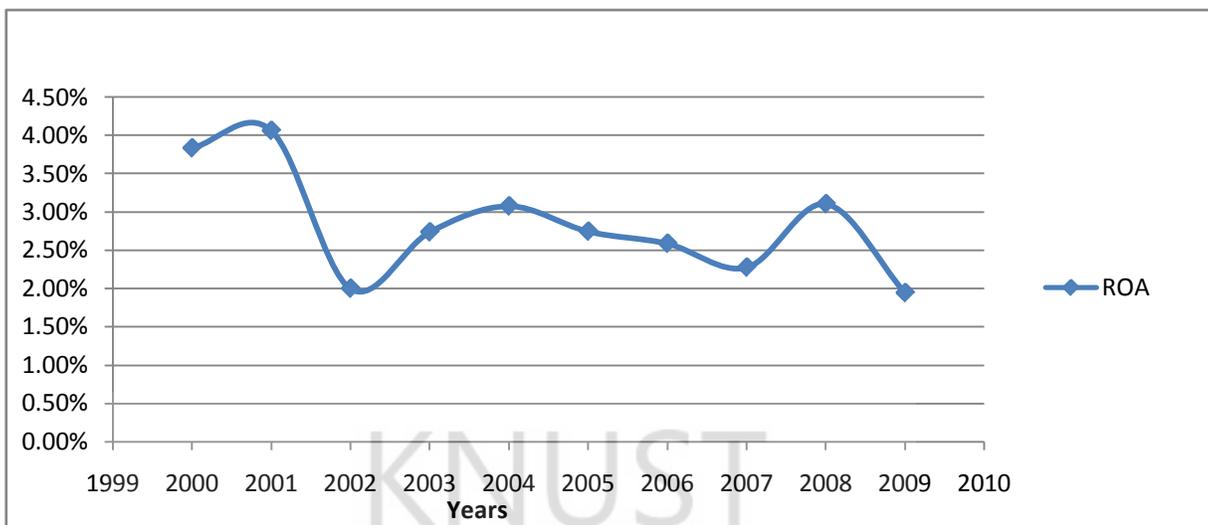
The banking industry has also witnessed the proliferation of electronic banking products such as internet banking, Short Message Service (SMS) banking, and other innovative electronic based services to facilitate online transactions and enquiries. There have been collaborations between some banks and telecommunication firms to fashion products to meet the needs of customers. While these platforms come with delightful products, adding value to banking services, it may also pose some risk of fraud if these platforms are not secured. The volume of online transactions would determine whether failure in these systems would have systemic impact on the industry as a whole. Bank of Ghana would have to foster information security policy and best practices to ensure that the banking public is protected. Amidst all these complexities,

the industry is expected to remain buoyant with increase in foreign direct investment, the new oil find and improved budget deficit.

## 1.2 Problem Statement

In the advent of declining industry profit in an increasingly complex banking sector, it has become imperative that bank managers understand the variables that significantly relate to the profitability of their business. This is paramount considering the fact that banks play a crucial role in the development of the economy. **Figure 1.1** shows a declining trend in industry profit over a period of ten (10) years. Figure 1.1 was based on financial data acquired from the Ghana Association of Bankers. In this figure, the Average Return on Asset (ROA) was used as a measure of profitability. Although industry profit peaked in 2004 and in 2008, the general trend has been downward.

The factors that influence profitability are myriad in theory but one needs to conduct empirical study to know the exact factors that influence the profitability of commercial banks in Ghana. To the best of the author's knowledge, there is no such study on profitability of commercial banks in Ghana. The problem of the study therefore is to investigate some key determinants of profitability and the extent to which they impact on profitability in the banking sector of Ghana.



**Figure 1.1: Declining Industry Profit**

### 1.3 Research Questions

Based on the research objectives the following questions are posed:

- What are the determinants (bank-specific, macroeconomic and financial structure factors) of profitability of commercial banks in Ghana?
- How are the determinants of bank profitability related to the profitability?
- What are the implications for policy direction for commercial banks and the Monetary Authority?

### 1.4 Objective of the study

The objective of the study is to determine the factors (bank-specific and financial structure factors) that influence profitability of Bank in Ghana.

### **1.5 Scope**

The scope of the study will be limited to studying the impact of internal and external factors that impact on the profitability of commercial banks, comprising of expenses management, capital adequacy, liquidity, asset quality, size, GDP, inflation, money supply and banking industry concentration. It is acknowledged that there are other factors that may impact on profitability of banks but not included in this study. These other factors may include but not limited to corporate governance, political stability, taxation, regulation indicators, quality of services and technological advancement. A future extension of this study may look at these factors. Another possible extension could be the examination of differences in the determinants of profitability of small and large or high-profit and low-profits banks. This study covers 26 commercial banks over the period 2000-2009.

### **1.6 Structure of the Study**

The whole thesis is divided into five chapters. The first chapter gives a background study and overview of the Ghanaian banking sector. The second chapter is a review of theoretical and empirical literature related to the determinants of profitability and the banking sector. The third chapter presents the data and methodology used in the study. Chapter four presents the analyses and discussions of results while conclusions and recommendations constitute the last chapter of this study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

There is extensive literature on profitability of banks concerning many countries but not much study has been done on the Ghanaian banking sector. Most of the studies on the Ghanaian banking industry have either focused on individual Ghanaian banks or the comparative performance of banks and their efficiency in terms of cost and economies of scale rather than an industry study of determinants of profitability. The present study will attempt to fill the vacuum.

There are myriads of factors that can impact on the profitability of commercial banks. It is not possible to explore all of these factors in this study. There are also theoretical models that underpin and predict the direction of the effects of the factors that impact the performance of institutions; prominent among them is the Structure Conduct Performance (SCP) model although it is also highly critiqued given the one-way view of the causal link among Structure, Conduct, and Performance.

The studies of the determinants of profitability have had two broad directions (Ramlall, 2009). There are studies that have focused on specific countries such as the studies of Berger *et al.* (1987); Berger (1995); Barajas *et al.*, (1999); Naceur *et al.*, (2001); Naceur (2003); Athanasoglou *et al.*, (2005); and Aburime (2008). There are also studies that have focused on a

panel of different countries such as the studies of Haslem (1968); Short (1979); Bourke (1989); Molyneux *et al.*, (1992); Bashir, (2000); and Abreu *et al.*, (2002). However, this study adopts the first approach to gain insights in the Ghanaian banking system.

This chapter presents the theoretical literature and the empirical literature of earlier studies. Under the theoretical literature study, we will discuss the Structure Conduct Performance (SCP) model, the Efficiency Hypothesis, the Capital Asset Pricing Model (CAPM) and briefly introduce the Expense-Preference Behaviour. The empirical literature delves into a combination of earlier works and variables that were adopted in the studies of profitability of commercial banks.

## **2.1 Theoretical Literature**

### **2.1.1 The Structure Conduct Performance (SCP) Model**

The Structure Conduct Performance (SCP) model is one of the earliest frameworks used to examine the factors that determine the profitability of Banks (Grygorenko, 2009). According to Baye (2010), the structure of an industry refers to the factors such as technology, concentration, and market conditions. Conduct refers to how individual firms behave in the market; it involves pricing decisions (such as interest rate, commission and fees), advertising decisions, and decisions to invest in research and development, among other factors. Performance refers to the resulting profits and social welfare that arise in the market. The Structure Conduct Performance (SCP) paradigm views these three aspects of the industry as being integrally related and asserts that the market structure causes firms to behave in a certain way. In turn, this behaviour causes resources to be allocated in certain ways leading to either an efficient or inefficient market. This model only fails to recognise that performance

can impact on structure and conduct while structure can impact on both performance and conducts. The Structure Conduct Performance (SCP) model therefore asserts that factors external to the organisations such as market conditions are primarily and indirectly, the determinants of profitability.

Mason (1939) and Bain (1951) were the earliest to suggest that profit of firms are determined by concentration level of the market. They demonstrated that profits of firms operating in highly concentrated industries are significantly higher than that of firms operating in industries with lower concentration. The Structure Conduct Performance (SCP) paradigm presupposes that a higher banking industry concentration permits the collusion of banks to set higher prices and consequently gain substantial profits (Mason, (1939); Bain (1951); Stigler (1964); Heggested (1977); Clark (1986); Ahmed et al., (1999); Sathye (2005); Samad (2008); Alzaidanin (2003); Pilloff *et al.*, (2002); Farooq (2003).

### ***2.1.2 Efficiency Hypothesis***

A theoretical attempt to offer an alternative explanation on the market Structure Conduct Performance (SCP) relationship was first made by Demsetz (1973) who also proposed the Efficiency hypothesis. He stated that higher profits of banks are not due to their collusive behaviour but because of high efficiency level, which in turn, leads to larger market shares that banks possess. In other words, profitability of bank is determined not by the market concentration but by bank efficiency (Grygorenko, 2009).

This hypothesis stipulates that a bank which operates more efficiently than its competitors gains higher profits resulting from low operational costs. The same bank

holds an important share of the market. Consequently, differences at the level of efficiency create an unequal distribution of positions within the market and an intense concentration (Mensi *et al.*, 2010).

Smirlock (1985) performed empirical examination of the Efficiency Hypothesis where he considered market share as a proxy to efficiency. In his empirical study of 2700 banks, Smirlock (1985) was able to demonstrate that there was no association between market concentration and bank profitability while significant relationship between bank profitability and market share was present. Thus by his work, the Structure-Conduct-Performance model was invalidated. However, Rhoades (1985) doubted the conclusion that the positive relation between market share and profitability was due to efficiency. He stated that this pattern might occur because of product diversification and correspondingly, ability of some banks to set higher prices on their services.

According to Grygorenko (2009), further empirical investigations did not bring clarification to the issue as to which of the theories mentioned above is best in explaining bank profitability: Ahmad *et al.* (1998) and Yu *et al.*, (2005) confirmed Structure-Conduct-Performance theory, while Mamatzakis *et al.*, (2003) and Naceur (2003) found evidence for Efficient-Structure hypothesis.

### **2.1.3 Capital Asset Pricing Model (CAPM)**

The Capital Asset pricing Model (CAPM) describes the relationship between risk and expected (required) return. In this model, the expected return on a firm's stock is defined as a function of risk-free rate and a premium based on the systematic risk. The greater the systematic risk, the greater the return the investors will expect from the security. The

underlying logic behind this model and its relevance in this study is based on the fact CAPM views the total portfolio risk as a function of systematic risk and unsystematic risk. The systematic risk is attributable to factors that affect the market as a whole such as government policies, changes in the economy and the political climate. The unsystematic risk is specific to a particular company such as industrial relations, quality of firm's management or a new competitor in the industry. Systematic risks cannot be avoided through diversification. However unsystematic risk can be avoided through diversification. Although the Capital Asset Pricing Model (CAPM) describes stock and portfolio risks it can be applied to firms. It asserts that in market equilibrium, a security is expected to provide return commensurate with its systematic risk. Investors should not be compensated for unsystematic risks as it assumes investors are rational and risk-averse enough to diversify unsystematic risks.

The Capital Asset Pricing Model (CAPM) has not gone unchallenged. It takes a very simplistic view of the relationship between risk and return neglecting the effects of market imperfections. As a result of these challenges it does not reflect the reality in the market. The *Asset Pricing Theory (APT)* extends the idea of the Capital Asset Pricing Model. This theory asserts that in a competitive market arbitrage will assure equilibrium pricing according to risk and return. The security expected return is the risk-free rate plus risk premiums for risk factors which are uncertain (Horne, 2008). The notion is the same as that of the Capital Asset Pricing Model with the exception that we now have multiple risk factors.

#### ***2.1.4 Expense-Preference Behaviour***

It is worth noting that profitability or bank returns is not the only measure of performance as used in the theories discussed so far. There are however other theories such as the Expense-Preference Behaviour hypothesis which uses utility instead of profits as a measure of performance. In this theory it is proposed that the main goal which managers pursue is to maximize not profit but own utility or utility of the firm, which is usually achieved via increasing salaries or other staff expenses (Williamson, 1963). We shall go no further on the Expense-Preference Behaviour - as this study is on profitability as a measure of performance.

## **2.2 Empirical Literature**

As was mentioned, to the best of the author's knowledge, there are no similar investigations of banking profitability in Ghana. Therefore the empirical literature presented here are studies conducted in other countries or markets but are however relevant to the study. The section discusses in the context of earlier studies, the measures of profitability, the internal determinants of profitability and the external determinants of profitability. We will then conclude the chapter with a summary of the expected relationships between profitability and determinants of profitability based on the empirical study.

### 2.2.1 Profitability Measures: Dependent Variables

The Return on Asset (ROA) and the Return on Equity (ROE) have been used extensively as measures of profitability. ROA indicates how effectively a bank is managing its assets to generate income. ROA is the income earned on each unit of asset usually expressed as percentage. The problem with ROA is that it excludes from the total assets off-balance sheet items (for instance, assets acquired through a lease) thereby understating the value of assets. This can eventually create a positive bias where ROA is overstated in the evaluation of bank performance. Nevertheless, Golin (2001), and Rose *et al.*, (2005) have argued that ROA is one of the most important measures of profitability in recent banking literature. The studies of Haron (2004), Hasan *et al.*, (2003), Bashir (2001), Demircuc-Kunt *et al.*, (1998), Naceur (2003), Alkassim (2005), and Alrashdan (2002) have all adopted ROA as a measure of profitability.

As an alternative measure of profitability the Return on Equity (ROE) is computed by dividing net income by equity. It measures the income earned on each unit of shareholders capital. The shortfall of this measure is that banks with high financial leverage tend to generate a higher ratio. Banks with high financial leverage may be associated with a higher degree of risk although these banks may register high ROE. Thus ROE may sometimes fall short in exposing the true financial health of banks. Another challenge with using ROE is that it is affected by regulation. However, ROE is commonly used in conjunction with ROA.

To evaluate the profitability of banks in this study, the Return on Average Assets (ROAA) and Return on Average Equity (ROAE) is used as measures of profitability. The ROAA and ROAE are slight variations of ROA and ROE respectively in that, instead of using the total assets at the end of the financial period in the denominators of the ratio, the average of the beginning balance and closing balance is rather utilised in computing the ratio. As numbers for assets are usually only available for the ends of reporting periods, the average is an

approximation that may not reflect highs or lows between the ends of reporting periods: it implicitly assumes that changes are fairly smooth. The interpretations for ROA and ROE are however the same as ROAA and ROAE respectively. However ROAA is used as the main measure of profitability. From this point onwards, ROA and ROE is used to mean ROAA and ROAE respectively in this study.

Standard Asset Pricing Models imply that arbitrage should ensure that riskier assets are remunerated with higher returns. Banks profitability should therefore reflect bank-specific risk, as well as macroeconomic risks or non-diversifiable (systemic) risk. In the light of this, most studies on determinants of profitability of commercial banks have considered bank-specific factors (internal factors) as well as industry or macroeconomic factors also known as external factors. The external factors can further be divided into macroeconomic factors and financial structure factors.

### **2.2.2 Internal Determinants**

The internal determinants of profitability can be defined as those factors that are influenced by the banks management decisions and policy objectives. The internal determinants may include but not limited to the size and location of branches, operational efficiency, marketing competencies, management competencies, motivation, quality and strategy. While it may be difficult if not impossible to assess some of these variables, they are implicitly reflected in the operating performance of the banks which can be derived from the balance sheet and income statements of the firms under study. It is therefore not surprising that earlier studies have employed financial ratios as proxies to measure internal

determinants. In this study, the relationships and impacts of Operating Efficiency, Capital Adequacy, Liquidity, Asset Quality and Bank size on profitability are analysed.

### **2.2.2.1 Operating Efficiency**

The Expense-to-Income ratio is used as proxy for operating efficiency. The Expense-to-Income ratio is defined as the operating costs over total generated revenues. The major elements of operating cost are staff salaries and administrative cost. It is used to measure the impact of efficiency on bank profitability. It is also used to provide information on the variation of bank cost over the banking system. A negative correlation is expected between the operating cost and profitability implying that higher operating cost means lower profit and vice-versa. However, this may not be the case as higher amounts of operating cost could also reflect higher volume of banking activities.

### **2.2.2.2 Capital Adequacy**

The ratio of Equity to total Asset is employed as a measure for bank Capital Adequacy. This measures the percentage of the total asset that is financed with equity capital. Capital adequacy therefore describes the sufficiency of the amount of equity that can absorb shocks that banks may experience. It is expected that the higher the Equity to Asset ratio, the lower the need for external funding and therefore the higher the profitability of the bank. In addition, well-capitalised banks face a lower cost of going bankrupt which reduces their cost of funding (Kosmidou, 2008).

But that is not all. Bank with higher capital to asset ratio are considered relatively safer and tend to have a better margin of cushion, remaining profitable even during economically difficult times. Conversely, banks with lower capital adequacy are considered riskier relative to highly capitalised banks. Thinking in line with the conventional Risk-Return Hypothesis, we anticipate an inverse relationship between capital adequacy and profitability.

Considering the fact that capital adequacy may have an ambiguous effect on profitability, theoretical expectation of capital adequacy remains a puzzle to be answered by empirical investigation.

### **2.2.2.3 Liquidity**

Liquidity measures the ability of banks to meet short-term obligation or commitments when they fall due. Traditionally, banks take deposit from customers and give out loans. For this reason, the ratio of bank's advances to customer deposits is used as proxy for liquidity. Liquidity is a prime concern for banks and the shortage of liquidity can trigger bank failure. Banking regulators also view liquidity as a major concern. This is because banks without sufficient liquidity to meet demands of their depositors risk experiencing bank run. Holding assets in a highly liquid form tends to reduce income as liquid asset are associated with lower rates of return. For instance, cash which is the most liquid of all assets is a non-earning asset. It would therefore be expected that higher liquidity would negatively correlates with profitability. Indeed, Molyneux *et al.*, (1992) and Guru *et al.* (1999) discovered that negative correlation exists between the level of liquidity and profitability. However, Bourke (1989), and Kosmidou *et al.* (2005) found a significant positive relationship between liquidity and bank

profits. Thus, conclusion on the impact of liquidity and bank profitability is indeterminate and may require further empirical work.

#### **2.2.2.4 Asset Quality**

The ratio of provision for bad debt to advances is adopted as proxy for asset quality. This measure reflects changes in the health of the bank loan portfolio and credit quality. Thus, it is also an indication of credit risk of banks. According to Heffernan (1996), credit risk is the risk that an asset or a loan becomes irrecoverable in the case of outright default, or the risk of delay in the servicing of the loan. Credit risk can have rippling effect thus leading to insolvency (Bessis, 2002).

The higher the provision for bad debt to advances ratio, the higher the credit risk and the higher the accumulation of unpaid loan and interest. Additionally, present value of the asset declines, thereby undermining the solvency of a bank. The Risk-Return Hypothesis implies that high risk should be associated with high profitability indicating a positive relationship. However, according to Kosmidou (2008), poor asset quality can have adverse impact on bank profitability, reducing interest income revenue, and by increasing the provisions cost.

### **2.2.2.5 Size**

In most studies of bank profitability determinants, the total asset is used a measure for bank size. Bank size is usually used to account for potential economies or diseconomies of scale in the banking sector. Additionally, bank size is associated with diversification which may impact favourably on risk and product portfolio. Economies of scale will reduce the cost of gathering and processing information (Boyd *et al.*, 1993) so that a positive effect of bank size is associated with profitability. Akhavein *et al.* (1997) and Smirlock (1985) found a positive and significant relationship between size and bank and profitability. Short (1979) argues, 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. Haslem (1968), Short (1979), Bourke (1989), Molyneux *et al.*, (1992) Bikker *et al.*, (2002) and Goddard *et al.*, (2004) have all linked bank size to capital ratios, which they claim to be positively related to size. These results imply that as size increases, profitability increases. This is especially true in the case of small to medium-sized banks.

On the other hand, increased diversification can reduce risk in the credit portfolio thereby reducing returns. Banks that have become extremely large may exhibit negative relationship between size and profitability as a result of bureaucracy and agency cost. According to Berger *et al.*, (1987), little cost saving can be achieved by increasing the size of a banking firm which suggests that eventually very large banks could face scale inefficiencies.

### **2.2.3 External Determinants**

The environments in which banks operate can influence their performance and can impact on their strategic positioning. The external determinants represent events outside the scope and influence of the banks. The external environment defines the legal, political, economical, technological, and social landscapes in which banks operate. These factors are external because the banks do not have control over them although banks can anticipate changes in the external environment and position themselves strategically to take advantage of them. The external landscape can further be divided into industry-specific (financial structure) determinants and macroeconomic determinants. The industry-specific determinants are only specific to the banking industry such as the industry concentration, price elasticity and developments in the banking industry. The macroeconomic-specific determinants reflect the general macroeconomic and market conditions in the country. In this study, banking industry concentration, money supply, Gross Domestic Product (GDP) and inflation are adopted as external factors to be examined as they are widely studied in other countries.



### **2.2.3.1 Bank Concentration**

The bank concentration is measured by the ratio of total assets held by five largest banks to the total assets of the entire banking sector. The bank concentration is used as a proxy for the market structure. According to the Structure Conduct Performance (SCP) hypothesis, markets with high concentration tend to collude and therefore earn monopoly profits as evidenced by Short (1979) and Molyneux *et al* (1996). Berger (1995) asserts that the relationship between bank concentration and performance in the USA depends critically on what factors are held constant. Gilbert (1984) reviewed forty-five studies and concluded that twenty-seven confirmed the structure-conduct-performance model. Naceur (2003), in his study of Tunisian commercial banks discovered there was significant negative relationship between concentration and bank performance. Thus, the impact of banking industry concentration and bank profitability is not conclusive from empirical literature.

### **2.2.3.2 Money Supply**

Money supply refers to the amount or stock of money available in the economy. It is dependent on the monetary policy pursued by the Central Bank. Typically, the Central Bank through the use of open-market operations and bank reserve ratio can exert profound influence on the volume of currency in the economy.

According to the quantity theory of money, changes in the money supply can induce changes in the nominal GDP and price levels. The Central Bank, through expansionary monetary policy, can increase the supply of money inducing a decline in price level and vice-versa. The study of Mamatzakis *et al.*, (2003) suggests that money supply which was used in the study as a measure of market size, significantly influenced bank profitability.

In the study of Badaruddin *et al.* (2009), it was indicated that events such as financial crises and financial deregulation may disrupt the relationship between money supply and bank stock returns. The results of the study support the hypothesis that there is a positive (negative) relationship between changes in money supply and the bank industry returns especially if the banking system is concentrated (competitive). According to their study, a concentrated banking system will ration credit and hence offer a lower deposit rate and higher interest rate than competitive banking systems. As concentrated banks are able to ration credit, the amount of credit will be lower; however, with the higher profit margins (higher interest rate and lower deposit rate), the bank stock returns will be higher. This results in the negative relationship between money supply and bank stock returns.

#### **2.2.3.3 Gross Domestic Product (GDP) Growth**

The GDP is the measure of total economic activity within the economy and it is commonly used economic indicator. In this study we employ the gross domestic product growth as a measure of macroeconomic conditions. The gross domestic product growth is the annual change in the GDP. According to Demirguc-Kunt *et al.*, (1999), Bikker *et al.* (2002), and Athanasoglou *et al.*, (2008), there is a positive association between economic growth and financial sector profitability. We anticipate therefore a positive correlation between GDP growth and profitability.

#### **2.2.3.4 Inflation**

The percentage change in the aggregate price levels is another macroeconomic variable which can affect both cost and revenues of banks. The effect of inflation on bank profitability depends on whether inflation is anticipated or unanticipated (Perry; 1992). By making accurate forecast of inflation, the manager can increase the rates on loan faster than the rate at which operating cost is increasing so that inflation favourably impacts on profitability. In the situation where inflation is unanticipated, bank managers are slow in adjusting the rate on bank loans so that the rate of increase of operating cost is faster than the rate of increase of bank revenue resulting in an adverse impact on profitability.

#### **2.2.4 Further Empirical Studies of Bank Profitability**

In addition to the studies discussed, the ensuing discussions highlight some bank profitability studies and empirical results. Mpesum (2010) analysed the determinants of profitability of Cal Bank Ghana Ltd., an indigenous Ghanaian Bank. Results suggest that industry concentration measured with Herfindhal-Hirschmann index was a major determinant of the bank's profitability. As concentration increased, the profitability of the bank decreased. He concluded that it is important that management of the bank place emphasis on improving their market share in the industry deposits in order to transform more of these deposits into interest-bearing assets which in turn will increase its profitability. The weakness of this work is that single bank in the industry would not be enough to give a good picture about the entire industry.

In contrast to using a single entity, Flamini *et al.*, (2009) adopted a more comprehensive approach and studied the determinants of commercial banks profitability in

the Sub-Saharan African. The analysis is based on a sample of 389 banks, operating in 41 countries from 1998-2006. The results signalled that apart from credit risk, higher returns on assets are associated with larger bank size, activity diversification, and private ownership. Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion. The results also indicate moderate persistence in profitability. Causation in the Granger sense from returns on assets to capital occurs with a considerable lag, implying that high returns are not immediately retained in the form of equity increases. Thus, the paper gives some support to a policy of imposing higher capital requirements in the region in order to strengthen financial stability.

Kosmidou (2008) used an unbalanced pooled time series dataset of 23 Greek banks to examine the determinants of performance during the period of EU financial integration (1990-2002). The results indicated that high Return on Average Assets (ROAA) was found to be associated with well-capitalized banks and lower cost to income ratios. Size was positive in all cases but statistically significant only when the macroeconomic and financial structure variables entered the models. Turning to macroeconomics and financial structure, the growth of gross domestic product (GDP) has a significant and positive impact on ROAA, while inflation has a significant negative impact.

In a related study, Grygorenko (2009) investigated the influence of price setting strategy on bank performance in Ukraine. He employed the Instrumental Variables Technique to explore this effect. It was found that the relationship between performance of the bank and its price setting policy is positive and statistically significant. According to these findings, banks with higher margins were more profitable. Also it was estimated that more profitable banks were characterized by strong capitalization level and high deposit-to-asset ratio. Such external factors as market concentration and inflation rate appeared to be insignificant in

determination of bank performance in Ukraine, contradicting the inflation findings of Kosmidou (2008).

Sufian (2009) employed the least squares methods of random effects, fixed effects, and ordinary least square models to provide empirical evidence on the factors that influence Non-Commercial Bank Financial Institutions (NCBFIs) profitability in Malaysia. The findings indicate that NCBFIs with a high loans intensity and credit risk tend to exhibit lower profitability level. On the other hand, large and more diversified NCBFI with high operational expenses and level of capitalization tend to exhibit higher profitability level.

Li (2000) investigated the impact of bank-specific factors and macroeconomic factors on bank profitability in the UK banking industry over the period 1999-2006. The aim of his study is to demonstrate the strength of risk management in banks. The results showed a negative correlation between loan loss reserves and profitability which was statistically significant. This implied that higher credit risk results in lower profits; a result which is consistent with that Sufian (2009). Capital strength was one of the main determinants of UK banks performance providing support to the argument that well capitalized banks face lower costs of going bankrupt, which reduces their cost of funding (Kosmidou, 2008). Finally, he observed that macroeconomic variables such as inflation, interest rate and GDP growth had insignificant impact on performance.

In the study of commercial banks in Jordan for the period 2005-2007 on Amman Stock Exchange, Al-Shubiri (2010) investigated the impact of bank characteristics, and financial structure variables on bank profitability. The researcher employed the Structure Conduct Performance (SCP) model in this study. To test the hypotheses, the researcher used simple and multiple regressions to develop two models. The results indicate that positive and significant

relationship exists between the pre-tax profit and the independent variables such as equity, debt, and expenses.

Vong *et al.*, (2009) examined the impact of bank characteristics as well as macroeconomic and financial structure variables on the performance of the Macao banking industry. It was demonstrated that the capital strength of a bank is of paramount importance in affecting its profitability. This result is in line with that of Al-Shubiri (2010), Li (2000) and Sufian (2009). On the other hand, the asset quality, as measured by the loan-loss provisions, affects the performance of banks adversely. In addition, banks with a large retail deposit-taking network do not achieve a level of profitability higher than those with a smaller network. Finally, with regard to macroeconomic variables, only the rate of inflation exhibits a significant relationship with banks' performance contrary to the finding of Li (2000) who demonstrated that inflation had insignificant impact on bank profitability.

El Biesi (2010) examined the profitability of foreign banks in nine economies of MENA (Middle East and Northern Africa) economies from 2002 to 2007. Using a panel dataset of 71 foreign banks, the paper investigates the impact of selected macroeconomic, financial market and bank specific determinants on foreign banks profitability. The results show that the most significant factors affecting foreign banks' profitability in MENA are capital, total assets and liquidity ratios at bank level, and stock market capitalization, trade volume, bilateral trade and level of income per capita growth on macro and banking industry level. Furthermore, factors such as concentration ratio, stock market trading volumes and turn over ratios have been investigated but appear to be insignificant factors.

Kosmidou *et al.*, (2005) studied the impact of bank characteristics, macroeconomic conditions and financial market structure on bank Net Interest Margin (NIM) and Return on

Average Assets (ROAA) in the UK commercial banking industry over the period 1995-2002. The results showed that the ratio cost-to-income is negative and statistically significant in all cases. Liquidity is negatively related to NIM but positively related to ROAA. The impact of loan loss reserves had a positive impact on NIM and is statistically significant whether we consider bank characteristics alone or not and implied that higher risks result in higher margins. Capital strength was one of the main determinants of UK banks performance providing support to the argument that well capitalized banks face lower costs of going bankrupt, which reduces their cost of funding. The macroeconomic variables observed showed that both inflation and GDP growth had a positive and significant impact on performance. Finally, the variables used as proxies for the relative development of the banking industry and the stock market are both positive and statistically significant to performance, irrespective of the measure that was used.

**Table 2.1** (Summary of Determinant of Profitability) presents a summary of the factors that have been discussed and are adopted in this study. The table gives a description of the factors discussed. It also shows the expected relationship between the dependent and the independent variables for both internal and external determinants.

<b>Measures and Factors</b>	<b>Description</b>	<b>Expected Relationship with Profitability</b>
<b><i>Profitability Measures</i></b>		
Return on Asset	The ratio of net-profit to average total assets of bank	N/A

Return on Equity	The ratio of net-profit to average total equity of bank	N/A
<b><i>Banks characteristics (internal factors)</i></b>		
Operating Efficiency	This is the expense-to-income ratio. It provides information on the efficiency of the management regarding expenses relative to the revenues it generates. Higher ratios imply a less efficient management (Kosmidou, 2008).	(-)
Capital Adequacy	This is a measure of capital adequacy, calculated as the ratio of equity to total assets. High capital–asset ratios are assumed to be indicators of low leverage and therefore lower risk (Kosmidou, 2008).	(+/-)
Liquidity	This is a measure of liquidity calculated as Advances over Deposits. It indicates the ability of bank to meet its short-term obligations. Higher figures denote lower liquidity.	(+/-)
Asset Quality	This is the ratio of Provision for bad debt to advances. It indicates how much of the total portfolio has been provided for but not charged off and is used as a measure of bank's asset quality and risk. Given a similar charge-off policy the higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio (Kosmidou, 2008).	(+/-)
Size	The natural log of the accounting value of the bank's total assets	(+/-)
<b><i>Macroeconomic and financial structure (external factors)</i></b>		
Growth in GDP	The annual change in the GDP	(+)
Inflation	The annual inflation rate	(+/-)
Money Supply	M2 money supply (M2=currency in circulation + Private demand deposits in local currency with banks + quasi-monetary deposits) Badaruddin et al., (2009).	(+/-)
Bank Concentration	The C <sub>5</sub> concentration measure calculated by dividing the assets of the five largest banks to the assets of all banks operating in the market (Kosmidou, 2008).	(+/-)

**Table 2.1:** Summary of Determinants of Profitability

## **CHAPTER THREE**

### **DATA AND METHODOLOGY**

#### **3.0 Introduction**

This chapter presents the study's selected research methodology. As shall be seen, the methodology is influenced by the purpose of this study and is based on an assessment of the optimal strategy for responding to the research questions. As such, the current chapter discusses the statistical and econometric tools used to analyse data for the purpose of answering the research questions. It includes the approach adopted to examine data for the chosen variables and the construction of empirical models.

#### **3.1 Data Source**

This study employs secondary data which are mainly annual accounting data of individual banks and macroeconomic data drawn for the period 2000-2009. Secondary data on bank financial was acquired from the Ghana Association of Bankers. Data on the macroeconomic indicators were obtained from the Bank of Ghana Research Department. From the financial data, which is basically bank's balance sheet and income statement, data on total assets, advances, provision for bad debt, and total annual overhead expense was used to estimate ratios and coefficients for the internal determinants. For the external determinants, macroeconomic data on Gross Domestic Product (GDP), inflation, and money supply was incorporated into the analysis. The time period selected was based on the fact that it offers recent time series observations and it constitutes a period of major changes for the Ghana banking system.

### 3.2 Sampling Criteria

All commercial banks institutions existing in the banking industry as at 2009 were sampled. The sampling criteria yielded an unbalanced dataset of twenty-six (26) banks. This ensures that all entities are represented in the sample.

### 3.3 Econometric Specification

To analyse the internal and external determinants of profitability, panel regression techniques were employed. According to Vong *et al.*, (2009), panel data are commonly used because it has the advantage of giving more information as it consists of both the cross sectional information, which captures individual variability, and the time series information, which captures dynamic adjustment. In short, panel modelling helps to identify a common group of characteristics while, at the same time, taking into account the heterogeneity that is present among individual units. Moreover, in panel data modelling, several data points are used which improves the degrees of freedom. The collinearity among the explanatory variables is also reduced thus the efficiency of economic estimates is improved.

Short (1979) and Bourke (1989) considered several functional forms and concluded that the linear model produces results as good as any other functional forms. It is therefore common to see that several literatures on bank profitability have adopted the linear functional form as an appropriate form of analysis. A linear form is therefore adopted in this study to analyse the panel data.

Having decided on the appropriate functional form, the panel data model can be estimated with either the fixed effect model, random effect model or the constant coefficient effects model. The fixed effects model allows the partial regression coefficients to be common across cross-sectional units, but the intercepts in the regression model are taken to be distinct among individual banks. A random effect model assumes that a common mean value for the intercepts exists and the cross-sectional differences in the intercept values of each bank are reflected in an error term. The constant coefficient effect model is appropriately utilized under the assumption that there are no significant variations in both intercepts (cross-sectional units) and slopes in a model. In that regards, the data can be pooled and ran as an Ordinary Least Squares (OLS) regression. A standard linear specification is:

$$\Pi_{it} = \beta_1 + \sum_{j=2}^k \beta_j X_{jit} + \sum_{p=1}^s \gamma_p Z_{pi} + \delta t + \varepsilon_{it} \quad (3.1)$$

Where  $\Pi_{it}$  is the dependent variable (the observation on profitability (ROA or ROE) for bank  $i$  at time  $t$ ), the  $X_j$  variables are observed explanatory variables (internal and external determinants of profitability), and the  $Z_p$  variables are unobserved explanatory variables. The  $Z_p$  variables are responsible for unobserved heterogeneity and as such constitute a nuisance component of the model. The index  $i$  refers to the unit of observation,  $t$  refers to the time period, and  $j$  and  $p$  are used to differentiate between different observed and unobserved explanatory variables.  $\varepsilon_{it}$  is a disturbance term assumed to satisfy the usual regression model conditions ( $\varepsilon_{it}$ 's are independently and identically distributed normal random variable). A trend term  $\delta t$  has been introduced to allow for a shift of the intercept over time. If the implicit assumption of a constant rate of change seems too strong, the trend can be replaced by a set of dummy variables, one for each time period except the reference period (Dougherty, 2006).

Because  $Z_p$  variables are unobserved, there is no means of obtaining information about the  $\sum_{p=1}^s \gamma_p Z_{pi}$  component of the model and it is convenient to rewrite (3.1) as:

$$\Pi_{it} = \beta_1 + \sum_{j=2}^k \beta_j X_{jit} + \alpha_i + \delta t + \varepsilon_{it} \quad (3.2)$$

where  $\alpha_i = \sum_{p=1}^s \gamma_p Z_{pi}$  known as the unobserved effect, represents the joint impact of the  $Z_{pi}$  on  $\Pi_{it}$ .

Both fixed effects and random effects models are improved versions of the Ordinary Least Squares (OLS). In this study, the fixed effects model was employed to estimate the model. The preference of the fixed effects model over the random effect model was based on the Hausman tests (Baltagi, 2001). The Hausman test determines whether the estimates of the coefficients, taken as a group, are significantly different in the two regressions (fixed effects and random effects). Under the null hypothesis that the  $\alpha_i$  are distributed independently of  $X_j$ , the test statistic has a chi-squared distribution. In principle this should have degrees of freedom equal to the number of slope coefficients being compared, but for technical reasons that require matrix algebra for an explanation, the actual number may be lower. In simple terms, the null hypothesis in the Hausman tests is that the preferred model is random effects as opposed to the alternative which says the preferred model is the fixed effect. It basically tests whether the unique errors ( $\alpha_i$ ) are correlated with the regressors, the null hypothesis is they are not.

The statistical package (Stata 11.0) was used to implement the tests, estimate the models, and to determine the actual degrees of freedom. The test statistic ( $\text{Prob} > \text{Chi}^2 = 0.0000$ ) is less than 0.05, leading to the rejection of the null hypothesis and acceptance of the alternative: fixed effect is preferred and appropriate model. The outputs from Hausman test is given in **appendix I** and **appendix II**.

We therefore estimate equation (3.2) with fixed effects, where it is assumed that differences in the characteristics of the banks are taken into account by differences in the constant (intercept). It can be shown that equation (3.2) is identical to (3.3). We therefore transform and re-write equation (3.2) as:

$$\Pi_{it} = \mu\alpha_i + \sum_{j=2}^k \beta_j X_{jit} + \delta t + \varepsilon_{it} \quad (3.3)$$

Where  $\mu\alpha_i$  captures the differences in the constant term of the corresponding banks. Equation (3.3) can further be decomposed in equation (3.4).

$$\Pi_{it} = \mu\alpha_i + \sum_{j=1}^m \beta'_j I_{jit} + \sum_{j=1}^n \beta''_j E_{jt} + \delta t + \varepsilon_{it} \quad (3.4)$$

where  $\sum_{j=2}^k \beta_j X_{jit} = \sum_{j=1}^m \beta'_j I_{jit} + \sum_{j=1}^n \beta''_j E_{jt}$ , and  $I_{jit}$  and  $E_{jt}$  are explanatory variables for internal and external determinants respectively.

### 3.4 Determinants and Variable Selection

In general the determinants of profitability are divided into two main categories, namely, the internal determinants and external determinants. The internal determinants are those factors that are influenced by the Bank's management decision and policy objectives and the external determinants reflect the economic and industry conditions. The subsequent discussions give justification for variables selected.

### **3.4.1 Performance measures: Dependent Variables**

Based on the arguments of Golin (2001), and Rose *et al.*, (2005), this study used the ratio of Return on Average Assets (**ROA**) and Return on Average Equity (**ROE**), as measures of bank's performance. Return on assets is the net profit after tax divided by average total assets and it indicates the returns generated from the assets financed by the bank. Average assets are being used in this study, in order to capture any differences that occurred in assets during the fiscal year. Return on average equity is the ratio of the net profit after tax to the average total equity for the fiscal year.

### **3.4.2 Internal Determinants of Profitability**

According to the literature review in the preceding chapter, five bank characteristics are used as internal determinants of performance. They are the Expense-to-Income ratio, the ratio of Equity to Total Assets, the ratio of bank's advances to customer deposits, the ratio of provision for bad debt to advances, and the bank's total assets which are proxies for expenses management, capital adequacy, liquidity, asset quality and size, respectively.

### **3.4.3 Justification for Choice of Variables**

The ratio of Expense-to-Income (**EOI**) measures the overheads or costs of running the bank, the major element of which is normally salaries, as percentage of income and it is used to provide information on variation of bank costs over the banking system. According to the argument advanced by Kosmidou (2008), although the relationship between expenditure and

profits appears straightforward implying that higher expenses mean lower profits and vice versa, this may not always be the case. The reason is that higher amounts of expenses may be associated with higher volume of banking activities and therefore higher revenues. It is expected that this variable will have a negative impact on performance because efficient banks are expected to operate at lower costs.

The ratio of Equity to Total Assets (**ETA**) is incorporated in the regression model as a proxy for capital adequacy. Capital adequacy refers to the sufficiency of the amount of equity to absorb any shocks that the bank may experience. According to Kosmidou (2008), it is expected that the higher the equity to assets ratio, the lower the need for external funding and therefore the higher the profitability of the bank. In addition, well-capitalized banks face lower risk of going bankrupt which reduces their costs of funding. The relationship therefore between capital adequacy and profitability is indeterminate requiring further empirical investigation.

Another important decision that the managers of commercial banks must take refers to the liquidity management and specifically to the measurement of their needs related to the process of deposits and loans. For that reason the ratio of bank's advances to deposits (**AOD**) is used as a measure of liquidity. From the literature review, Molyneux *et al.*, (1992) and Guru *et al.* (1999) discovered that negative correlation exists between the level of liquidity and profitability. However, Bourke (1989), and Kosmidou *et al.*, (2005) found a significant positive relationship between liquidity and bank profitability. Thus the relationship between liquidity and profitability is indeterminate.

The ratio of provision for bad debt to advances (**POA**) indicates how much of the total portfolio has been provided for but not charged off and is used as a measure of bank's asset quality. The variable (**POA**) is incorporated into the regression model as a proxy for asset

quality and credit risk. Poor asset quality and subsequently credit risk can have rippling effect and thus lead to insolvency (Bessis; 2002). From the literature review, the higher the ratio, the poorer the quality and therefore the higher the risk of the loan portfolio will be. On one hand, the risk-return hypothesis implies a positive relationship between risk and profits. On the other hand, bad asset quality may have a negative impact on bank profitability by reducing interest income revenue and by increasing the provisions costs.

Bank's size (**NLA**) included in the regression model is considered an important determinant of performance. The variable **NLA** is the natural logarithm of the total asset as used in most studies of banking. In the literature review, the relationship between size and profitability is indeterminate, since some studies found economies of scale for large banks and others diseconomies for larger banks.

#### **3.4.4 External determinants**

The external environment in which banks operate have on them. Therefore, the financial market structure, the economic condition of the country, the legal and political environment all may influence the performance of the banks. In this study, two sets of external determinants are examined: the macroeconomic and the financial structure indicators.

The variable (**BKC**) is captured in the regression model to measure banking industry concentration. It indicates the relative development of the banking industry. (**BKC**) is calculated as the total assets held by the five largest commercial banks in the banking divided by the total assets of all commercial banks in the banking industry. From the literature review, banks in highly concentrated markets tend to collude and therefore earn monopoly profits.

However, not all studies, have found evidence to support the Structure Conduct Performance (SCP) hypothesis. The expected relationship is therefore indeterminate.

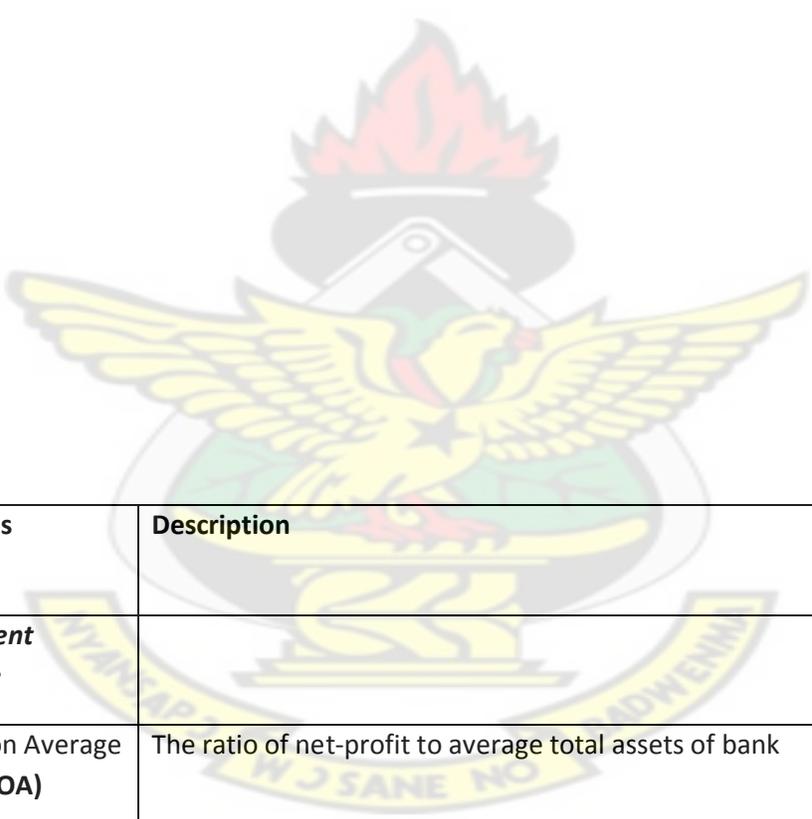
The variable (**LMS**) is incorporated into the regression equation to measure the stock of money supply at the end of each period. (**LMS**) is the natural log of M2 money supply. The M2 money supply is composed of currency in circulation, private demand deposits in local currency with banks and quasi-monetary deposits. From literature review, Mamatzakis *et al.*, (2003) used the supply of money as a measure of market size and found that it significantly influences bank profitability. Badaruddin *et al.*, (2009) indicated the impact of money supply on bank performance depends on the industry concentration. They concluded that in a highly concentrated banking industry, money supply and bank performance are negatively related. Therefore, relationship between money supply and bank profitability is indeterminate.

Gross domestic product (**GDP**) is among the most commonly used macroeconomic indicators, as it is a measure of total economic activity within an economy. The gross domestic product growth (GDP), calculated as the annual change of the GDP is used as a measure of the macroeconomic conditions. A positive relation is expected between the performance of the banks and this variable based on the findings of Bikker (2002).

The variable (**INF**) is used as a proxy for percentage change in aggregate price levels. Staikouras *et al.*, (2003) point out that inflation may have direct effects and indirect effects on the profitability of the banks. From the literature review, the impact of inflation on profitability depends on whether the inflation is anticipated or unanticipated. If anticipated, the interest rates are adjusted accordingly resulting in revenues, which increase faster than costs, with a positive impact on profitability. If inflation is unanticipated, the banks may be slow in adjusting

their interest rates, which results in a faster increase of bank costs than bank revenues that consequently have a negative impact on bank profitability.

The variable chosen to measure the profitability of banks along with those chosen to test the factors that affect it are presented in **Table 3.1**. This table is an extension of **table 2.1** (Summary of Determinants of Profitability) to include the variables to be incorporated into the regression models.



<b>Variables</b>	<b>Description</b>	<b>Priori Restriction</b>
<b><i>Dependent Variable</i></b>		
Return on Average Asset ( <b>ROA</b> )	The ratio of net-profit to average total assets of bank	N/A
Return on Average Equity ( <b>ROE</b> )	The ratio of net-profit to average total equity of bank	N/A
<b><i>Internal factors</i></b>	<b><i>Independent Banks characteristics</i></b>	
Operating Efficiency ( <b>EOI</b> )	This is the Expense-to-Income ratio. It provides information on the efficiency of the management regarding expenses relative to the revenues it generates.	(-)

	Higher ratios imply a less efficient management (Kosmidou, 2008).	
Capital Adequacy (ETA)	This is a measure of capital adequacy, calculated as the ratio of equity to total assets. High capital–asset ratios are assumed to be indicators of low leverage and therefore lower risk (Kosmidou, 2008).	(+/-)
Liquidity (AOD)	This is a measure of liquidity calculated as Advances over Deposits. It indicates the ability of bank to meet its short-term obligations. Higher figures denote lower liquidity.	(+/-)
Asset Quality (POA)	This is the ratio of Provision for bad debt to Advances. It indicates how much of the total portfolio has been provided for but not charged off and is used as a measure of bank’s asset quality and credit risk. Given a similar charge-off policy the higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio (Kosmidou, 2008).	(+/-)
Total Assets (NLA)	The natural log of the accounting value of the bank’s total assets	(+/-)
<b>External factors</b>	<b>Macroeconomic and financial structure</b>	
Growth in Gross Domestic product (GDP)	The annual change in the GDP	(+)
Inflation (INF)	The annual inflation rate	(+/-)
Money Supply (LMS)	Natural Log of money supply. (M2=currency in circulation + Private demand deposits in local currency with banks + quasi-monetary deposits) (Badaruddin et al., (2009).	(+/-)
Bank Concentration (BKC)	The C <sub>5</sub> concentration ratio calculated by dividing the assets of the five largest banks to the assets of all banks operating in the market (Kosmidou, 2008).	(+/-)

**Table 3.1: Variable Description**

### 3.5 Empirical Model

The empirical model used in this study is given as:

$$ROA_{it} = \mu\alpha_i + \beta'_1EOI_{1it} + \beta'_2ETA_{2it} + \beta'_3AOD_{3it} + \beta'_4POA_{4it} + \beta'_5NLA_{5it} + \beta''_1GDP_{1t} + \beta''_2INF_{2t} + \beta''_3LMS_{3t} + \beta''_4BKC_{4t} \quad (3.5)$$

$$ROE_{it} = \mu\alpha_i + \beta'_1EOI_{1it} + \beta'_2ETA_{2it} + \beta'_3AOD_{3it} + \beta'_4POA_{4it} + \beta'_5NLA_{5it} + \beta''_1GDP_{1t} + \beta''_2INF_{2t} + \beta''_3LMS_{3t} + \beta''_4BKC_{4t} \quad (3.6)$$

Where:

$ROA_{it}$ : Return on Average Asset

$ROE_{it}$ : Return on Average Equity

$EOI_{1it}$ : Expenses over Income for Bank  $i$  in year  $t$

$ETA_{2it}$ : Equity over Total Asset for Bank  $i$  in year  $t$

$AOD_{3it}$ : Advances over Debt for Bank  $i$  in year  $t$

$POA_{4it}$ : Provision for Bad Debt over Advances for Bank  $i$  in year  $t$

$NLA_{5it}$ : Natural Logarithm of Asset

$GDP_{1t}$ : Gross Domestic Product Growth for year  $t$

$INF_{2t}$ : Annual Inflation Rate for year  $t$

$LMS_{3t}$ : Natural Logarithm of Money Supply at the end of year  $t$

$BKC_{4t}$ : C<sub>5</sub> Bank Concentration for year  $t$

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

Endogenous model:

1.  $H_0^1: \beta_j' = 0; j = 1,2,3,4,5$
2.  $H_1^1: \beta_j' \neq 0; \textit{otherwise}$

Exogenous model:

1.  $H_0^2: \beta_j'' = 0; j = 1,2,3,4$
2.  $H_1^2: \beta_j'' \neq 0; \textit{otherwise}$

Both endogenous and exogenous model

1.  $H_0^3: \beta_j' = 0; \beta_j'' = 0; j = 1,2,3,4,5$
2.  $H_1^3: \beta_j' \neq 0; \beta_j'' \neq 0; \textit{otherwise}$

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

$$T = \beta_j' / se(\beta_j') \approx t_{\frac{\alpha}{2}, n-k} \text{ and } T = \beta_j'' / se(\beta_j'') \approx t_{\frac{\alpha}{2}, n-k} \text{ (where } n-k \text{ is the degrees of freedom)}$$

Thus, the null hypothesis follows a T distribution where  $se(\beta_j')$  and  $se(\beta_j'')$  are standard errors of  $\beta_j'$  and  $\beta_j''$  respectively. If  $T > |t_{\frac{\alpha}{2}, n-k}|$ ; then we reject the null hypothesis and accept the alternative hypothesis that the parameter estimate is significant (at 5% significant level) in determining bank profitability. Otherwise we accept the null hypothesis that the driver is not significant. The statistical package (Stata 11.0) was used to compute the T-statistics and the p-values. The F-tests were automatically compiled by the statistical package to measure the explanatory power of multiple regression models.

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## CHAPTER FOUR

### ANALYSIS AND DISCUSSIONS

#### 4.0 Introduction

The empirical evidence on the determinants of profitability of commercial banks in Ghana based on panel data of banks over the period 2000-2009 is presented in this chapter. The chapter highlights the descriptive statistics of the selected variables, the correlation matrix and finally the empirical model. The panel data was diagnosed for the presence of autocorrelation and heteroscedasticity. Econometric specifications for the Return on Average Asset (ROA) and Return on Average Equity (ROE) have been estimated using Generalised Least Squares (GLS) technique. This technique is especially suitable for data sets where serial correlation and heteroscedasticity might be present (Pindyck *et al.*, 1991).

#### 4.1 Descriptive Statistics

The **table 4.1 (Appendix III)** presents the summary of descriptive statistics of the variables captured in the regression model. These statistics were generated to give overall description of the data used in the model and enable the researcher screen the data for any suspicious figure. The key descriptive measures are the mean, standard deviation, the minimum and the maximum values of the variables over the period under consideration. Key highlights as discuss in the ensuing discussion.

From **table 4.1**, it is apparent that the natural logarithm of total assets variable (NTA) had the largest standard deviation which reveals that the size of banks had more significant

variance than other variables over the period. However, the variable GDP growth had the least standard deviation which suggests that economic growth has been stable when compared to the other variable over the period. On average, the industry profit relative to asset is high although it is on decline as indicated in **Figure 1.1** in the introduction of this study. The average industry profitability (ROA) stands at 2.97% with -15.95% and 17.13% as minimum and maximum values respectively. The bank concentration variable (BKC) indicates that the minimum industry concentration is 60.56% while the maximum is 78.25%. The banking industry has generally remained highly concentrated over the period with a mean concentration of 69.06%.

#### 4.2 Correlation Matrix

The **table 4.2 (Appendix III)** presents the correlation matrix for all the variables incorporated into the model. The coefficient of correlation provides an index of the direction and the magnitude of the relationship between two set of scores without implying causality. The sign of the coefficient is an indication of the direction of the relationship. The absolute value of the coefficient indicates the magnitude.

Correlation matrix is useful to the extent that it reveals whether there are elements of multicollinearity in the data. Multicollinearity is the situation when some or all of the explanatory variables are highly related making it difficult to tell which of them is influencing the dependent variable. The severity of multicollinearity would be manifested in a situation where all p-values of regression coefficients are insignificant but overall model having significant F statistic.

### 4.3 Regression Results

To estimate the panel regression models in equations (3.6) and (3.7), the Hausman test was performed to determine the appropriateness of the model to be adopted, where the null hypothesis is that the preferred model is random effects and the alternative states that the fixed effects is preferred. As indicated by the Hausman test ( $H= 38.91$  with a  $p$ -value = 0.0000), the difference in coefficients between fixed effect and random effect is systematic, providing evidence in favour of a fixed effects model. Based on the Wald test for groupwise heteroscedasticity in fixed effects regression model ( $chi2 (26) = 1.4e^{+29}$   $Prob>chi2 = 0.0000$ ), we reject the null hypothesis and conclude heteroscedasticity exists in the data. The presence of autocorrelation was diagnosed employing Wooldridge Test for autocorrelation. We reject the null hypothesis that no autocorrelation existed given a large F statistic ( $F_{(1,21)} = 16.777$ ,  $Prob > F = 0.0005$ ). The outputs for heteroscedasticity and autocorrelation are presented in **appendix IV** and **appendix V** respectively. A similar test was conducted for the ROE model and hence the estimation of the two models with Generalised Least Square (GLS). The regression results for the ROA and ROE are presented in **table 4.3** and **table 4.4** respectively, indicating also, the F-test results.

**Table 4.3:** Regression Results: ROA Dependent Variable

	Coefficients	Std. Err.	z	P> z
<b>ETA</b>	0.0814140	0.0128941	6.31	0.000
<b>AOD</b>	-0.0058939	0.0015226	-3.87	0.000
<b>POA</b>	-0.0477768	0.0154649	-3.09	0.002
<b>EOI</b>	-0.0637145	0.0025593	-24.90	0.000
<b>NTA</b>	0.0033546	0.0006219	5.39	0.000
<b>INF</b>	0.0204579	0.0026240	7.80	0.000
<b>GDP</b>	0.8073814	0.0649592	12.43	0.000
<b>BKC</b>	-0.0392766	0.0052351	-7.50	0.000
<b>LMS</b>	-0.0181698	0.0015558	-11.68	0.000
<b>_cons</b>	0.2526352	0.0176908	14.28	0.000

(Wald chi2(9) = 1374.88, Prob > chi2 = 0.0000)

The **table 4.3** summarises the empirical results for model (3.5) (ROA model in chapter three). ROA indicates how effectively a bank is managing its assets to generate income. ROA is the income earned on each unit of asset usually expressed as percentage. The ROA model is a multiple regression equation comprising of nine explanatory variables out of which five are bank-specific. From the regression results, all nine variables are statistically significant.

The variable, ratio of Equity to Total Asset (ETA) has a positive and statistically significant relationship with bank performance (ROA). This positive influence implies that the higher the capital adequacy of banks (lower leverage), the more profitable the banks become. This result is consistent with the findings of Berger (1995), and Hassan *et al.*, (2003). The increase in bank capitalization by the Monetary Authority will not only provide a margin of protection in the advent of economic shocks but it will also ensure that banks remain profitable. It also implies that banks should ensure that they are well capitalised if they must remain profitable.

The variable, Advances over Deposits (AOD) was used as a proxy for liquidity in the model. The result indicates that the liquidity variable has a significantly negative influence on bank profitability. This implies that high figures for this variable mean low profitability. Since high figures for this variable denotes low liquidity, lower liquidity is associated with lower profitability. The result is inconsistent with the assertion that holding assets in a highly liquid form tends to reduce income. The result is however in line with the findings of Bourke (1989), and Kosmidou *et al.* (2005) who concluded in their study that liquidity positively correlates with profitability.

The variable, Provision for bad debt over Advances (POA) was incorporated into the model to measure asset quality and credit risks. The result indicates that credit risk has negative and statistically significant relationship with bank profitability implying that the higher the credit risk of banks the lower the profitability. The higher the provision for bad debt to advances ratio, the higher the credit risk and the higher the accumulation of unpaid loan and interest. This results is in line with that of Bessis (2002) who asserts that poor asset quality

can have adverse impact on bank profitability reducing interest income revenue and increasing the provisions cost.

The variable, Expense over Income (EOI) was included in the model to capture the impact of operating efficiency on bank profitability (ROA). As expected, operating expense has a negative and statistically significant relationship with bank profitability according to the regression results. A chunk of bank's expense is composed of salary expense and administrative cost. It is possible that high bank salaries and administrative expenses are not being translated proportionately into profitability.

The natural logarithm of total asset (NTA) was used as proxy for size in the regression model according to the studies of Boyd *et al.*, (1993). The result indicates that size is positive and statistically significant to bank profitability. This implies that bank size induces economies of scale thereby making larger banks more profitable. Economies of scale will reduce the cost of gathering and processing information. The larger the bank size, the more profitable the bank. It could also mean that bank size is associated with diversification which may impact favourably on risk and product portfolio. This result is consistent with the findings of Akhavein *et al.*, (1997), Smirlock (1985), Haslem (1968), Short (1979), Bourke (1989), Molyneux *et al.*, (1992) Bikker *et al.*, (2002) and Goddard *et al.*, (2004).

Turning to the macroeconomic and financial structure variables, the result indicates that inflation (INF) variable which was captured in the model is significant and had a positive influence on bank profitability. This signals that bank managers are able to forecast accurately inflation and are proactive in managing anticipated inflation. By making accurate forecast of inflation, the manager can increase the rates on loan faster than the rate at which operating

cost is increasing so that inflation favourably impacts on profitability. This result is consistent with most studies (Bourke, 1989; Molyneux *et al.*, 1992; Athanasoglou *et al.* 2005).

The Gross Domestic product (GDP) variable was incorporated into the regression model to analyse the impact of economic activity on bank profitability. The result indicates that GDP has a positively significant influence on bank profitability. This supports the findings of Demirguc-Kunt *et al.*, (1998), Bikker *et al.*, (2002), and Athanasoglou *et al.*, (2005) who have concluded that there is a positive relationship between economic growth and bank profitability.

The bank concentration variable (BKC) was used as proxy for market structure. The result indicates a negative and significant relationship between bank industry concentration and profitability, contrary to the postulation of the Structure-Conduct-Performance model. As the industry becomes more concentrated, bank profitability declines. As indicated earlier, the impact on concentration on bank profitability depended critically on what factors are held constant (Berger, 1995). The result is however consistent with the results of Naceur (2003), who indicated in his study of profitability of commercial banks in Tunisia that bank concentration had a negative influence on profitability

The natural logarithm of money supply was incorporated into the model to analyse the impact of money supply on bank profitability. According to the quantity theory of money, changes in the money supply can induce changes in the nominal GDP and price levels. Although it is generally expected that the increase in money supply should impact favourably on bank profitability, Badaruddin *et al.*, (2009) indicated in their study of bank stock returns and money supply in the United State that events such as financial crises and financial deregulation may disrupt the relationship between money supply and bank stock returns. The impact of money supply on bank profitability is therefore dependent on whether the industry

is concentrated (positive) or competitive (negative). The regression results indicate that money supply has negative and statistically significant influence on bank profitability.

The **table 4.4** depicts the regression results for the ROE model which we adopted as an alternative measure of profitability. ROE (Return on Equity) measures the income earned on each unit of shareholders capital. Apart from the GDP, BKC, and POA, all the variables in the ROE model were consistent with that of the ROA model. The variables GDP, BKC, and POA were insignificant as far as bank profitability (ROE) is concerned. Interestingly, ETA variable used to capture the impact of capital adequacy on bank profitability was significant but contrary to that of the ROA model, ETA had negative influence on bank profitability. As the capital adequacy is increased, the earning power of each cedi invested in the business by the shareholder is reduced.

**Table 4.4:** Regression Results: ROE Dependent Variable

ROE	Coefficient	Std. Err.	z	P> z
ETA	-1.0201540	0.1094519	-9.32	0.000
AOD	-0.0327931	0.0167515	-1.96	0.050
POA	-0.0333597	0.0525072	-0.64	0.525
EOI	-0.2471264	0.0326622	-7.57	0.000
NTA	0.0350654	0.0074348	4.72	0.000
INF	0.2487070	0.0849013	2.93	0.003
GDP	1.3270660	1.6512690	0.80	0.422
BKC	0.0295568	0.1589415	0.19	0.852

<b>LMS</b>	-0.0919769	0.0341012	-2.70	0.007
<b>_cons</b>	1.2348120	0.4946856	2.50	0.013

(Wald chi2(9) = 352.39, Prob > chi2 = 0.0000)

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## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATION

#### 5.0 Introduction

This chapter presents the summary of findings, conclusions and recommendations based on the results. The summary presents a snapshot of the study, recounting the various highlights of the study. The inference based on the empirical study is captured in the conclusion while the recommendations are proposed based on the conclusions.

#### 5.1 Summary

The importance of the role of banks in the economic development and growth of a country cannot be underestimated. A healthy financial system is a prerequisite for proper financial mediation leading to sustainable private investment and the promotion of entrepreneurship. The banking industry has witnessed many reforms and policies over the

past decade. The competitive landscape and operational environment have become dynamic. There is heightened pressure on banks to compete as banks have become more integrated into the global financial system. In order to withstand economic shocks and to maintain financial stability, it is imperative to identify the determinants that influence bank profitability in Ghana and the extent of their impacts. This is objective this study sought to accomplish.

This study examined the determinants of bank profitability in Ghana. These determinants were categorized into internal factors which are bank-specific characteristics and external factors. The external factors were sub-divided into macroeconomic factors and financial structure factors. This categorization was in line with earlier studies (Short, 1979; Bourke, 1989; Molyneux *et al.*, 1992; Demirguc-Kunt *et al.*, 1998) on bank profitability where profitability was viewed a function of both internal and external determinants. Two key measures of profitability (dependent variables) were used in this study. These comprised of Return on Average Asset (ROA) and Return on Average Equity (ROE). The explanatory variables used in the regression models were mainly financial ratios. This included equity over total asset, expense over income, advances over deposits, provision for bad debt over advances, bank size (bank total asset), inflation, Gross Domestic Products (GDP), money supply and banking industry concentration. The variables were specially chosen to measure the impact of capital adequacy, operating expense, liquidity, asset quality, size, inflation, gross domestic products, money supply and bank concentration on profitability respectively. A panel data of 26 banks was analysed over a period of 2000-2009.

### **5.1.1 Impact of Bank-Specific Factors**

Using ROA as a measure of bank profitability, all the bank-specific variables were found to be significant in determining profitability. The results indicate that well capitalised banks are more profitable as capital adequacy had a positive and significant impact on bank profitability. The results also indicate that there is a positive relationship between liquidity and profitability implying that the more liquid a bank is the more profitable it becomes. Concerning asset quality and bank profitability, asset quality measured in terms of the ratio of provision for bad debt to advances has a significant negative impact on bank profitability. This implies as the asset quality deteriorates (credit risk increases) the profitability of the bank also decreases. The study also found a significant negative relationship between operating expense and bank profitability implying that banks are not efficiently translating their expenses into profits. The findings of the study also suggest that large banks tend to enjoy economies of scales as size is positively related to bank profitability.

Measuring profitability with ROE, the effects of bank-specific variables were not very much different from the results of the model with ROA. The only difference was in term of the capital adequacy variable. This variable was negatively related to profitability (ROE) contrary to the case of (ROA) where capital adequacy was impacting positively on profitability.

### **5.1.2 Impact of Macroeconomic and Financial Structure Factors**

Apart from bank-specific factors that impact on bank profitability, there are exogenous factors that impact on profitability. These were the macroeconomic and financial structure variables that were incorporated into the model which included variables for inflation, Gross Domestic Product, money supply and bank industry concentration. Inflation, GDP, money

supply, and industry concentration were all significant in the ROA model while only inflation and money supply were significant in the ROE model. In the ROA model, inflation was significant and had a positive influence on bank profitability implying that as the rate of inflation is increasing, profitability increases. It also implies that bank managers are able to predict inflation and adjust lending rates accordingly. The inflation result was consistent with the ROE model. Similarly, Gross Domestic Product (GDP) is positively significant to bank profitability. This implies that as the rate of growth of the economy increases, bank performance is improved. The health of the economy is directly reflected in the health of the banks. Interestingly, money supply was negatively significant to bank profitability. As indicated in the preceding chapter, the impact of money supply on profitability may be dependent on how competitive or concentrated the banking industry is; money supply seems to make negative impact on bank returns when the industry is highly concentrated while the opposite is true when the industry is competitive. Finally, bank concentration was negatively significant to bank profitability, failing to support the Structure-Conduct-Performance (SCP) model. As banking industry concentration increases, bank profitability declines. The bank concentration result for the ROA model was also consistent in the ROE model.

## 5.2 Conclusion

The study examined the factors or determinants that influence and impact on bank profitability. Two main determinants of bank profitability were identified; the internal determinants and the external determinants. The internal determinants are bank-specific and can be controlled by the bank manager. The external determinants are outside the control of banks although banks can strategically be positioned to exploit the opportunities in these environments or mitigate threats from this environment. The external environment defines

the sociological, regulatory, political, technological and the economic landscapes in which banks in which banks operate.

Using Return on Asset (ROA) as the main measure of bank profitability, five internal determinants comprising of capital adequacy, operating efficiency, liquidity, asset quality and bank size and four external determinants comprising of GDP, inflation, money supply and banking industry concentration were significant to bank profitability. The results suggest that well capitalised banks a more profitable. Also, larger banks tend to enjoy economy of scale impacting positively on profitability. Efficient management of bank operations can enhance bank profitability. However, holding assets in a highly liquid form tends to increase income. Banks with poor asset quality and thus high credit risk are less profitable. Moreover, banks are more profitable when the economy is growing. Banks are also able to accurately predict inflation and as result, adjust lending rates accordingly. Finally, banks are more profitable when there is competition leading to efficiency and innovation; a result which fails to support the Structure Conduct Performance (SCP) model. Apart from GDP, banking industry concentration, and asset quality, all the determinants were consistent when bank profitability was measured by Return on Equity (ROE). However, capital adequacy was negatively significant to bank profitability in the case of ROE.

### **5.3 Recommendations**

The following recommendations are provided for policy direction based on the finding of this study:

1. Bank capitalization should be encouraged so that bank performance can be enhanced.

Banks should endeavour to retain earnings to boost up capital rather than paying

exorbitant bonuses. A well capitalized banking system will ensure financial stability and make the industry more resilient against external shocks and risk. This is because well capitalised banks have lower financial risk and thus are more likely to survive financial crisis. The study of Flamini *et al.* (2009) on the determinants of bank profitability, gives some support to a policy of imposing higher capital requirements in the Sub-Saharan region in order to strengthen financial stability. In line with this, the recapitalization requirement by the Central Bank is appropriate.

2. Efficient and effective liquidity management should be adopted by bank managers to ensure that banks do not become insolvent. Since banks are less profitable when less liquid, bank managers should be encouraged to invest in more liquid assets. This will not only improve bank profitability but it will also enable banks meet their short term obligations as they fall due. It is possible that liquid bank assets are more profitable due of some market inefficiency. Further empirical study will be required to establish this.
3. Bank managers and credit officers must adhere to prudential guidelines in the administration of credit. Banks must be encouraged to establish an appropriate credit risk environment, operate under a sound credit-granting process, strictly adhering to know your customer (KYC) norms, maintain an appropriate credit administration, measurement and monitoring process (both on-site and off-site supervision) and ensure adequate controls over credit risk. These practices should also be applied in conjunction with sound banking supervision practices related to the assessment of asset quality, the adequacy of provisions and reserves, and the disclosure of credit risk. The establishment of the Collateral Security by the Central Bank is appropriate as it ensures the integrity of the collateral instruments and transparency in credit administration process.

4. Efficient management of bank operations can alleviate the high operational cost that erodes bank profits. Bank occupancy cost and salaries are major components of operational cost. Bank must be encouraged to employ more technologies to automate their service delivery. The use of ATMs and electronic based bank services would reduce the number of branches that would be required. Moreover, these technologies would enable banks to explore new markets without maintaining a physical presence. It would reduce the number of staff costs, occupancy cost, paper cost and queuing times in the banking halls. Bank branches should only be built at strategic locations. Banks must take collaborative and radical steps in building capacity of IT employees to reduce over reliance on foreign consultants who demand outrageous fees for software license and maintenance contracts. Managerial cost and other expenses should be at optimal level and consistent with profit maximisation objectives of shareholders.
5. Economy of scale derived from bank size play a crucial role in bank profitability. The benefit of size would reflect in the ability to reach wider markets. Banks should therefore be encouraged to look beyond local market and strategically expand their operations to other geographical markets and sectors of the economy. Location of bank branches is strategically paramount if banks must maximise return on investment. The agriculture and agro-processing sector is still a potential market for banks. In conjunction with branch expansion, bank should consider diversification of their product portfolio. In this way banks can leverage on their assets to offer other ancillary services and maximise returns.
6. Although inflation seemed to have a positive influence on bank profitability, high inflation may generally be undesirable. The results suggest that probably, bank managers are accurately predicting inflation and are able to adjust their lending rates accordingly. Low inflationary regimes create stable economy and a congenial

investment climate for businesses, enabling businesses to pursue long term project critical to their survival and growth.

7. As indicated earlier, a healthy economy is a prerequisite for healthy banking system. Hence, the positive relationship between Gross Domestic Product (GDP) and bank profitability is in line with theory. Thus, government policies on employment and investments should be intensified to increase the profitability of banks. In an economy where government stimulates the creation of jobs and creates the right investment climate for both local and foreign investors, banks are likely to thrive well. Apart from creating jobs, the government should foster entrepreneurship among the youths. Proceeds from the oil sector can be invested in other sectors where there seems to be resources but no capital to convert these resources into finished goods and services.
8. Banking industry concentration negatively impacts on profitability implying that banks are not being efficient and innovative. Thus, the banking sector should be liberalised a bit more to allow investors to come in. This will not only induce competition but add value to services rendered to customers. The high concentration can thwart the achievement of monetary policy objectives. As indicated in the study, there is the tendency for banks in a concentrated industry to ration credit and make high returns to the extent that this credit rationing will affect the supply of money and thwart the monetary policy of the Central Bank.
9. In future research work, it might be useful to understand the factors that impact on effectiveness of monetary policy of the Central Bank since money supply significantly and negatively relate to bank profitability. This is because the Central bank can have the right policy objectives but certain prevailing factors in the industry can be an impediment to the realisation of these objectives.

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## APPENDICES

### APPENDIX I: DURBIN-WU-HAUSMAN TEST OUTPUT

#### ROA MODEL

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
<b>ETA</b>	-0.0910739	0.0314614	-0.1225353	0.0292007

<b>AOD</b>	0.0082051	0.0057645	0.0024406	0.0047783
<b>POA</b>	0.0293220	0.0222155	0.0071065	.
<b>EOI</b>	0.0130403	0.0170443	-0.0040039	0.0012775
<b>NTA</b>	0.0114645	0.0080706	0.0033939	0.0031345
<b>INF</b>	-0.0294063	-0.0119668	-0.0174395	.
<b>GDP</b>	0.2118501	0.2544892	-0.0426391	.
<b>BKC</b>	0.1065483	0.0794438	0.0271044	.
<b>LMS</b>	-0.0236737	-0.0166455	-0.0070282	.

b = consistent under  $H_0$  and  $H_a$ ; obtained from xtreg

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

Test:  $H_0$ : difference in coefficients not systematic

$$\text{Chi2}(9) = (b-B)'[(V_b-V_B)^{-1}](b-B) = 38.91$$

Prob>chi2 = 0.0000 ( $V_b-V_B$  is not positive definite)

#### **APPENDIX II: DURBIN-WU-HAUSMAN TEST OUTPUT**

##### **ROE MODEL**

---- Coefficients ----

	<b>(b)</b>	<b>(B)</b>	<b>(b-B)</b>	<b>sqrt(diag(<math>V_b-V_B</math>))</b>
	<b>fixed</b>	<b>random</b>	<b>Difference</b>	<b>S.E.</b>
<b>ETA</b>	-1.706503	-0.5886557	-1.117847	0.1605144
<b>AOD</b>	0.0536111	0.0425801	0.011031	0.0174538
<b>POA</b>	0.0491982	-0.0767556	0.1259537	.
<b>EOI</b>	0.1160634	0.1214302	-0.0053668	.

<b>NTA</b>	0.0678322	0.0513226	0.0165097	0.0158983
<b>INF</b>	0.1052768	0.1774085	-0.0721317	.
<b>GDP</b>	3.610479	3.047121	0.5633578	.
<b>BKC</b>	0.6011554	0.422241	0.1789144	.
<b>LMS</b>	-0.1812925	-0.1344649	-0.0468276	.

b = consistent under Ho and Ha; obtained from xtreg

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

Test: H<sub>0</sub>: difference in coefficients not systematic

Chi2(9) = (b-B)'[(V<sub>b</sub>-V<sub>B</sub>)<sup>(-1)](b-B) = 44.00</sup>

Prob>chi2 = 0.0000 (V<sub>b</sub>-V<sub>B</sub> is not positive definite)

### **APPENDIX III: DESCRIPTIVE STATISTICS AND CORRELATION MATRIX**

**Table 4.1:** Descriptive Statistics

<b>Variable</b>	<b>Observation</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>ROA</b>	191	0.0296749	0.0284173	-0.1595	0.1713
<b>ROE</b>	191	0.2617387	0.2010021	-0.5054	1.2286
<b>ETA</b>	191	0.1345785	0.1001883	0.0264	0.8524
<b>AOD</b>	191	0.6810529	0.3532502	0.0546	2.6330
<b>POA</b>	191	0.0404853	0.0675857	0.0000	0.8030
<b>EOI</b>	191	0.6892084	0.5086242	0.0474	4.1672
<b>NTA</b>	191	14.101170	1.3799350	9.0870	16.7689

<b>INF</b>	260	0.1846000	0.0832465	0.1050	0.4050
<b>GDP</b>	260	0.0544723	0.0100877	0.0374	0.0727
<b>BKC</b>	260	0.6905500	0.0602141	0.6056	0.7825
<b>LMS</b>	260	14.12232	0.7263661	12.7704	15.15094

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**Table 4.2:** Correlation Matrix

	<b>ROA</b>	<b>ROE</b>	<b>ETA</b>	<b>AOD</b>	<b>POA</b>	<b>EOI</b>	<b>NTA</b>	<b>INF</b>	<b>GDP</b>	<b>BKC</b>	<b>LMS</b>
<b>ROA</b>	1										
<b>ROE</b>	0.7805	1									
<b>ETA</b>	0.0992	-0.2784	1								
<b>AOD</b>	0.0171	-0.0624	0.1561	1							
<b>POA</b>	0.0472	-0.0824	0.0643	-0.1642	1						
<b>EOI</b>	0.1302	0.0684	0.1850	-0.1597	-0.1392	1					
<b>NTA</b>	0.0371	0.1367	-0.2674	0.3900	-0.1681	-0.3711	1				
<b>INF</b>	0.1378	0.1982	0.0687	-0.1492	0.1336	-0.0655	-0.3299	1			
<b>GDP</b>	-0.1425	-0.1699	0.0195	0.3998	-0.2677	0.0879	0.476	-0.5895	1		
<b>BKC</b>	0.2096	0.2462	-0.0436	-0.3416	0.1655	-0.0175	-0.4788	0.5203	-0.5861	1	
<b>LMS</b>	-0.1893	-0.2224	0.0078	0.4000	-0.2698	0.0874	0.5313	-0.6727	0.9299	-0.7873	1

## APPENDIX IV: DIAGNOSIS FOR HETEROSCEDASTICITY

### **ROA MODEL**

Modified Wald test for groupwise heteroscedasticity in fixed effect regression model

$H_0: \sigma(i)^2 = \sigma^2$  for all  $i$

chi2 (26) = 1.4e+29

Prob>chi2 = 0.0000

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### **ROE MODEL**

Modified Wald test for groupwise heteroscedasticity in fixed effect regression model

$H_0: \sigma(i)^2 = \sigma^2$  for all  $i$

chi2 (26) = 848.60

Prob>chi2 = 0.0000

## APPENDIX V: WOOLDRIDGE TEST FOR AUTOCORRELATION

### **ROA MODEL**

Wooldridge test for autocorrelation in panel data

$H_0$ : no first-order autocorrelation

$F(1, 21) = 16.777$ , Prob > F = 0.0005

## ROE MODEL

Wooldridge test for autocorrelation in panel data

$H_0$ : no first-order autocorrelation

$F(1,21) = 8.019$ , Prob > F = 0.0100

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