An Empirical Analysis of Bank Profitability in Ghana: Evidence from Bank-Specific and Macroeconomic Factors

Mohamed DORE

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Prof. Dr. Elvan Yilmaz
Director

I certify that this thesis satisfies the requirements as a thesis for the degree of Master of Science in Banking and Finance.

Assoc. Prof. Dr. Salih Katircıoğlu
Chair, Department of Banking and Finance

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Master of Science in Banking and Finance.

Assoc. Prof. Dr. Nesrin Özataç
Supervisor

Examining Committee

1. Prof. Cahit Adaoğlu

2. Assoc. Prof. Dr Salih Katircıoğlu

3. Assoc. Prof. Dr. Nesrin Özataç

ABSTRACT

The purpose of this study is to analyze the bank-specific and macroeconomic determinant of profitability of seven commercial banks in Ghana for the period of seven years (2005 to 2011). This study uses the panel regression analysis to empirically examine these relationships. The findings show that both capital adequacy and the liquidity are positively related to bank profitability in Ghana banks. In addition, the study also indicates that the profitability in Ghana banking industry is negatively affected by the level of macroeconomic factors such as inflation and GDP.

Finally, we conclude that the bank-specific and macroeconomic factors have significant effect on the bank profitability in Ghana.

Keywords: Profitability, Bank, Return on Asset, Return on Equity, Ghana.

ÖZ

Bu çalışmanın amacı Gana'daki 7 ticari bankanın 2005-2011 yılları arasında banka ve makroekonomik faktörlerin incelenmesidir. Bu çalışmada ampirik analiz araçlarından olan panel regresyon analizi yöntemi kullanılmıştır. Ampirik analiz sonuçlarına göre varlık kalitesi, yönetim etkinliği, likidite, enflasyon ve büyüme oranının varlık ve özsermaye getirisine etkisi saptanmıştır.

Sonuç olarak iç ve dışsal değişkenlerin karlılık üzerine etkisi statistiksel olarak kanıtlanmıştır.

Anahtar Kelimeler: Finansal Kurum, Karlılık, Banka, Varlık Getirisi, Özsermaye getirisi.

To my late mother

MRS. KANALY GHANSHARA

''N'na Marie''

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LIST OF ABBREVIATION

NBFI: Non-Bank Financial Institution.

FINSSP: Financial Sector Strategic Plan

SEC: Security and Exchange Commission

LTS: Long Term Saving

CUA: Credit Union Association

GSE: Ghana Stock Exchange

BOG: Bank of Ghana

GIPC: Ghana Investment Promotion Center

ROE: Return on Equity

ROA: Return on Asset

ASQ: Asset Quality

CAR: Capital Adequacy

LQR: Liquidity

EFF: Efficiency

INF: Inflation

GRT: Growth

Chapter 1

INTRODUCTION

1.1 Background of the Study

Today's modern and complex economic system cannot operate without the banks. Banking system has facilitated the transfer of resources from savers to borrowers. The process of supplying funds to a country's economy makes her performance significant and also enhances economic growth. Therefore, the banking sector is the keystone of Ghana economy, for that reason, its health is extremely vital for the economic system at large. The Ghanaian banking industry in recent years has grown at a fast pace by increasing the number of operating banks across the country and promoting rapid competitiveness within the banks. Basically, a bank's objective rotates around the direction of growth in their net asset and their profitability as sited by Aremu et al (2010). They indicated that the major problem of bank management was to consider the short term plan over its long term goals. Despite the short term plan target, banks give preferences to internal than external factors (Myers et al, 1984). They found that internal financing determine the decision making and obviously affect the bank performance. In Ghana, it has been noticed that financial management concentrates more generally on profitability in short term, with a few care on adverse risk on the quality of asset that has more effective impact on long run of the financial services. As such, it is important to understand the determinant and the drivers of bank profitability which is essential in the stability of the economy.

The banking industry is developing and becoming competitive, thus it is essential that banks should function efficiently in order to respond to the rising demand. Assisting the current development of sound banking industries is, however, essential for a given developing country like Ghana that is on the verge of turning into a middle income country. For this reason, we are doing this analysis to assist the banks and to find out to what degree they are profitable by choosing seven different commercial banks in the country. Regardless of different profitability measurement, majority of the banking analysis have found that capital adequacy, net expenses and provision for loan losses are essential determinants of greater profitability. And in this analysis two determinants will be regarded (internal factors and external factors of profitability).

The internal factor of profitability can be determined as anything that affects the bank management decision making and that can affect the output of the bank even thought a good management quality will increase the performance in the bank operation.

The external factor can be considered out of bank management control. Sound management can anticipate external event and take advantage to mitigate for possible exposure.

1.2 Objective of the Study

Highlighting the research based on Ghanaian banks demonstrate that to which extent banks are profitable by using its goals on the quality and macroeconomic tools. The main aim is to analyze factors that affect the bank profitability and their performances and also to set a recommendation plan which can be applied by

management for decision making in order to mitigate losses for the coming period in the field of banking sectors. Consequently, the main analysis will be focused on internal and external factors that affect the Ghanaian bank efficiency for the period between 2005 and 2011.

1.3 Statement of the Problem

The Ghanaian banking industries consist of high number of small however weak banks. Saunders et al, (2001), found that the inadequacy of capital requirement and gap management brought the necessity of the new Basel 2[1]accord to come into play. In order to support and establish a global standard for banking rules and regulation to offset the risk faced by those small banks.

Below are listed the vulnerabilities that are identified and can be undertaken in the study:

- Bank contagion, if parent bank collapse it triggers the local.
- The poor lending practice has been observed by state owned bank[2].
- Internal risk management pattern on debt to domestic, engendered deficiencies illiquidity.
- Deficiencies on the weak credits, delay on collaterals (debt recovery, credit risk).
- The exchange rates implication for the bank efficiencies.
- Liquidity risk problem to be kicked off for those relaying heavily on public deposit and wholesales account.

[1] Basel Committee on Banking Supervision provides a forum for regular cooperation on banking supervisory matters. Its objective is to enhance understanding of key supervisory issues and improve the quality of banking supervision worldwide. New Basel accord is a commitment by financial authorities to apply a minimum capital requirement to internationally active bank. It defines the measure the capital and measure of risk.

[2] IMF, 2011. Financial System Stability assessment Update, IMF country Report Na11/131.June 2011.

1.4 Organizational Structure

This study is formed with different structures, chapter one is based on introduction which outlined the general idea of the study. The objectives, the statement of the problem pictures present the real message of the thesis. Chapter two sketches the general perspectives of the country banking sectors by stating the true descriptive event, goals and target of the regulatory authorities on banking and non-financial matter.

Chapter three includes literature review of the past written subject in the same field of study by different scholars. Radical changes are mentioned in chapter four where empirical analyses with the methodology of the study, with dependent and independent variables are used on selected banks, and also, panel data approach is applied testify the macroeconomic and bank-specific effects.

As a conclusion, chapter five will display the results of the study. Finally in chapter six the conclusion and a written recommendation for additional studies will be presented.

Chapter 2

A GENERAL PERSPECTIVE OF BANKING INDUSTYRY N GHANA

The Banking industry in Ghana began in 1894 with the Bank for British West Africa now is known as Bank of Ghana (BOG). As in March 1957, the country celebrated the end of British rule as a result many banks were established (Bank of Ghana 2010). As of today, there are 26 depository banks that are operating with endless possibilities of the services. As part of its policies, the Central Bank has given the permission for the establishment of foreign banks in Ghana. Consequently, the banking industry has experienced the arrival of a large number of foreign banks. The main objective for implementing this policy is to support the growth of a strong financial system (Price Waterhouse, 2008). The Ghana banking industry has experienced rapid changes which are attributed to technological transformation and the increase in competition between the liberalized financial industry and the Non-bank financial sector.

The banking industry has experienced rigorous competition in the past due to provision of limited services by Commercial, Development and Merchant banks which resulted in low profits. The competitive nature of the industry gave rise to the creation of universal banks as all the banks are presently providing a broad range of similar services in order to increase their market share in the industry. Due to technological innovation, it can be said that the services provided by the banking

industry are not exhaustive. The industry still has the potential to develop more innovative services in order to increase its revenue generation avenues (Paul et al, 2006).

Difficulties in the financial sector such as high interest rates and liquidity problems in the past lead to structural and economic reforms in the financial sector. In 1987, the central bank introduces a restructuring and transformation program known as Financial Sector Adjustment Program (FINSAP) to improve the deterioration financial performance. The FINSAP financial reform were carried out in phases with FINSAP 1, 2, 3 and the major objective were to review the legal regulatory environment and adjust the existing banking acts, to restructure the banking sector to make them viable and efficient and to revitalize the financial sector by creating new institution (Sowa, 2003). Under adjustment program Ghana capital market, rural banks, non-financial services and foreign exchange were established. But as of 2012 Statistics gotten from the regulatory Authorities, have fully operational financial services across the country:

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2.1 Supervision and Regulation in Ghana Financial System

In 2003, the Bank of Ghana (BOG) and the establishment of FINSAP 2 through support of the Security and Exchange Commission of Ghana (SEC) were responsible for the technical assistance and the capacity to enhance the performances in the area of supervision, surveillance and enforcement and also to support the long term saving (LTS) and the enactment of several laws critical for implementation of reforms. Giving the necessary support for the comprehensive supervision, obligation and the duties between Bank of Ghana (BOG), Credit Union Association (CUA) and the rural banks. By also, providing capacity of building on how to improve insurance supervision and research. Strengthening the review of Ghana Stock Exchange (GSE) and support it automations (GIPC, 2011).

2.2 Ghana Regulatory Authority

The bank of Ghana (BOG) has the overall supervisory and regulatory authority over the matter based on banking and non-financial sector. His mission is to accomplish a sound and efficient financial system. Therefore, to regulate and ensure a price stability which act as a gateway of economic growth and wealth creation.

The primary responsibility of the central bank was to act as a regulator which is enforced under Act 612 and Act 673(Central Bank, 2012). It regulates, supervises and directs the bank system and credit system to ensure the operation smoothly of a safe and sound banking system. It proposes the reforms related to banking sector. Therefore, the central bank drills its obligation to make sure that:

- There is average competition within the banks
- Sustaining the efficiency of the system

- Saver deposit is secure.
- Make sure that the asset quality, capital adequacy and liquidity is insured.

In sum, the bank of Ghana (BOG) supervisory function is planned to be uniform with BASEL core principle based on banking services.

2.3 Security and Exchange Commission

The SEC is the body created by the government to oversee the Ghanaian security markets. The law was established in 1993 known as PNDC law 333 (BOG, 2012). It manages the Ghana fund management industry, improves the legal, regulatory structure of the financial sectors, likewise it provides the certification of the stockholder. In addition to these functions, it investigates the failures that subject to market operator's company code including the national unit fund trusts. In addition, mergers, acquisitions, takeovers and other types of financial subrogation are subject to the approval of the Securities and Exchange Commission.

2.4 National Insurance Commission

The NIC as an independent Authority regulating the country insurance sector specifically act to ensure supervision, control over insurance and re-insurance business, it also assigns to approve and arbitrate claims of the insured deposit taking financial services. The NIC has the duty to protect deposits, public education on insurance and assign to enforce strong administrative supervision and control over the country insurance sector. They also focus on the relationship with foreign insurance association in order to develop a common review on universal insurance standard.

2.5 Bank of Ghana

Known as the Central Bank of Ghana (BoG), the bank has been active since 1957. The BoG is the highest institution that regulates the financial sector of the economy. BoG is primarily charged with the responsibilities of promoting monetary stability and the health of the financial system. It also acts as a banker and financial advisor to the Federal Government. It is a central institution that develops the country financial sector policies by promoting, regulating and supervising effective and conducive monetary measure of stabilization to maintain strong financial system as well as the non-banking financial institution (Awojobi, 2011).

Thus, the BOG bears the obligation to guarantee, maintain and serve as a gate to economic growth and wealth creation. The responsibilities and core purposes of the BOG as regulators are determined in Act 612 and Act 673 aiming to appoint officer as head of banking supervision to propose reforms and to ensure smooth operation with a good and sound banking system (Bank of Ghana, 2010).

As of today, there are 26 licensed operating banks listed in the table below as 11 foreign and 15 domestic banks. BoG as mentioned above, hold the key policies in regulating and supervising effective monetary stabilization and they are uniform with Basel core principle on banking supervision. The Basel core principle is effective on banking supervision providing minimum standards for sound prudential regulation and supervision of the banking system. They are used by countries as a benchmark for assessing the quality of their supervisory system and identifying future work to achieve a baseline level of sound supervisory practices. They are also used by International Monetary Fund (IMF) and the World Bank (WB) in the context of

FINSAP, and to assess the effectiveness of countries banking system and practices (Basel III, 2011).

The table 1 displays the products and services that are provided such as loans, deposits, investments, money transmission and international services.

Table 1: List of banks in Ghana.

No	Name of Bank	Date of Establishment
1	Agriculture Development Bank	1997
2	Amalgamated Bank	1965
3	Barclay's bank (Ghana) Ltd	1916
4	Bank of Baroda (Ghana) Ltd	2008
5	Banque Sahelo-Saharienne	1999
6	Cal Bank	1990
7	Ecobank Ghana Ltd	1990
8	Fidelity Bank	2006
9	First Atlantic Merchant Bank	1995
10	Ghana Commercial Bank	1953
11	Guaranty Trust Bank Limited	1990
12	Home Finance Company Bank Ltd (HFC)	1990
13	International Commercial Bank	1994
14	Intercontinental Bank	1989
15	Merchant Bank Ghana Ltd	1983
16	National Investment Bank	1963
17	Prudential Bank Ltd	1996
18	Societe General- Social Security Bank- SG-SSB	1975

Table 1; List of Banks in Ghana Continuation

19	Stanbic Bank Ghana Ltd/Standard Bank	1862
20	Standard Chartered bank (Ghana) Ltd	1969
21	Standard Trust Bank	1996
22	The Trust Bank	1996
23	UBA Bank (United Bank for Africa)	1949
24	Unibank	1997
25	UT Bank (Unique Trust Bank)	2009
26	Zenith bank	1990

Source: http://www.gipcghana.com/web.php?pageNum_pub_list=1&totalRows_pub_list=25&id=6

Table 2: List of Selected Banks and their Total Asset

Number	Names of Banks	Total Asset-million USD
1-	Ghana Commercial Bank	1.270 Billion USD
2-	Unique Trust Bank	378,4 m USD
3-	Prudential bank Ltd	287,453 m USD
4-	Home Finance Company Bank Ltd	234,453 m USD
5-	Uni bank	91,213 m USD
6-	Fidelity bank	53,852 m USD
7-	Cal Bank	41,099 m USD

Sources: http://en.wikipedia.org/wiki/List_of_banks_in_Ghana

Notes: The Spot Exchange rate from U.S Dollar to Ghanaian Cedi

1 USD = 1.90149 GHS as of today 28/01/2013

Chapter 3

LITERATURE REVIEW

In the literature, there are many studies done on bank profitability. It has been one of the topics that have received a very great interest in recent years. The studies undertaken are centered on banking profitability analysis based on individual countries or cross-countries. The overall analysis and evidence propose that bank profitability is separated into two variables namely internal and external factors. Empirical studies and similar theoretical literature develop some contradictory knowledge or indication, mixed findings used to measure the profitability. In a comprehensive way focus on the related studies. Investigating the determinants of the factors of the Ghanaian banking profitability and GDP growth, a similar study approach were done by Sufian.F and Muzafar S.H. (2008) that investigates the determinants of bank profitability in a developing economy, an empirical evidence in Bangladesh. They concluded that the bank-specific factors, loan intensity, asset quality and capital adequacy which are the main factors that affect the profitability while GDP turnout to be insignificant and inflation negatively significant. Also more recently, a study is done by Yong Tan and Christos Floros (2012) that examine the effect of GDP growth on bank profitability in China. They tested the persistence of profitability in Chinese Banking industry. Their findings suggest that there is a negative relationship between GDP growth and the bank profitability. The study indicates that the Chinese banking system is significantly affected by the level of non-performing loans.

Guiliano et al (2006), analysed the ownership structure and the risk performance on banking sector. They evaluated the impact of the risk, the cost efficiency. They also proved that public owned banks have low profitability. And also, found that the privately owned ones have a higher insolvency risk which are due to their poor loan indicators and finally conclude that in a bank, the ownership concentration cannot affect bank profitability significantly.

Panayiotis, et al (2006) conducted a study on banking specific industry specific and macroeconomic determinants of bank profitability during the period of 1985-2001. They examine Greek banks using the traditional structure conduct-performance (SCP) hypothesis, which assumed to rigidly conduct and determine a decision based on output and performance of the overall banking industries structure through an approach of competition, which could be the most efficient way for banking industries.

Fadzlan et al (2009) examines the Chinese banking sector on profitability and macroeconomic indicators over the period of 2000-2005. The paper indicates that credit risk, liquidity risk and capitalization on commercial banks are significant and have positive impact on profitability. Furthermore, higher credit risk leads to be efficient and profitable with the Joint Stock Commercial Bank (JSCB). The result of their findings states that in commercial banking the size and cost exhibit a lower profitability; in contrast, better capitalized state owned commercial bank (SOCB) with more diversified result in a higher level of profitability. The effects of the macroeconomic indicator ensure a positive outcome of the economic growth and banks profitability.

More recently, Khizer Ali et al (2011) thoroughly explore the evidence the evidence of bank-specific and macroeconomic indicators of profitability from the Pakistanis'commercial banks from 2006-2009. They significantly find that the profitability ratio's such as return on asset (ROA) and the return on equity (ROE) determine the impact of bank-specific macroeconomic fact on bank efficiency. The results suggest both economic growth and asset management indicate a positive efficiency with the use of the ratio ROA and ROE. They also conclude the fact that a lower profitability level is derived from higher capitalized and higher credit risk.

Selim Akhter and Kevin Daly (2009), explained the panel data structure to investigate the bank health and weaknesses in various macroeconomic conditions across 50 countries using a panel analysis. The indicators reveal a solid effect on business cycle on the size or the magnitude, the inflation and mainly the capital adequacy. Further, the mentioned factors confirm strong evidence resulting about the profitability such as the bank specific, macroeconomic factor, the business cycle factors which include credit risk, capital risk and inflation etc.

Although many studies on banks profitability's, Fadzlan Sufian (2010), has explored and analyzed the profitability and efficiency of Korean banking sector. It states that with a greater profitability and liquidity, the credit risk signals negative indication under financial and controlled and uncontrolled macroeconomic conditions. In contrast, Gross domestic product (GDP) and inflation confirm a strong and opposite cyclicality linkage on profitability. The study examines data from the period of 1994 to 2008, which remind the calm period among the Asian financial crisis (1997) and

the recent global financial crisis (2008). Consequently, these periods reflected a negative insight on Korean banking system.

In a comprehensive and recent study, Gul et al (2011) investigated the determinants of profitability of banks; Marijana examined the profitability in Macedonian bank during 2005-2010, whereas Gul et al (date) conducted a study on Pakistani banks from the period of 2005-2009. At the core of this study, they found that bank size, expenses and capital management as internal factors and GDP, the stock market and economic conditions have the as external factors have most substantial consequences on both countries banking sector growth and profitability. As a recent study, Valentina Flamini et al (2009), studied the bank profit of Sub-Saharan Africa (SSA). They investigated the determinants of profitability by taking a sample of 389 Banks in some 41 states in SSA countries. In addition to that, they indicate that larger bank size, spread of activities, higher the return of the asset of the bank are the other factors that influence the performance. As a result, it signals the increment in profitability. They also defend that in order to fortify or have a strong financial stability; banks must insure a sound capital adequacy in the region.

Sehrish Gul et al (2011), worked on the factors affecting bank profitability in Pakistan by analyzing bank-specific and macroeconomic factors of 15 Pakistani commercial banks during 2005-2009. The pooled Ordinary Least Square (POLS) were used to assess the effects of the internal and external factors on banking profitability. And the empirical outcome stated that factors affecting Pakistani banks such as GDP have a substantial influence on the profitability.

Chapter 4

DATA AND METHODOLOGY

The purpose of this study based on Ghanaian banks is to analyze the growth and profitability assessment of seven banks across the period between 2005 and 2011. This analysis were accomplished on the basis of internal and external factors, Similarly, the main target of this analysis like previously mentioned is to examine the bank profitability by empirically using the bank specific and the panel data will be applied and the effect of macroeconomic variable like inflation and the GDP growth.

4.1 DATA

The data were collected from individual banks data base (BOG, 2012) and is regarded as comprehensive tool for research and the World Bank database. Financial data and figures are denominated in Ghanaian Cedis (million).

Table 3. Dependent and Independent Variables description

Variables	Description	Hypothesis
	Independent Variable	
	Internal Factor	
Capital Adequacy (CAR)	Total Equity/ Total Asset	+
Asset Quality (ASQ)	Total Loan/ Total Asset	+
Liquidity (LQR)	Asset / Total Asset	-
Efficiency (EFF)	Interest Income / Interest Expense	+
External Factor		
Inflation (INF)	$I= \frac{Po-P1}{P1} * 100$	-
Growth (GRT)	$\frac{GDP2 - GDP\ 1}{GDP\ 1} = GDP$	-
Dependent Variable		
Return on Equity (ROE)	Net Income / Total Equity	
Return on Asset (ROA)	Net Income / Total Asset	

4.2 Panel data Analysis

The intention of this computable model sketched in this part is to catch the effect of bank specific and macroeconomic factors on bank profitability. A chain of bank specific factors which have been applied in past analysis based on bank efficiencies are applied.

4.3 Independent Variable

Independent variable is made up into two (2) separated classes as internal and external factors.

Internal Factors are the factors that include in the model and an emphasis is made on the Capital Adequacy, Asset Quality, Management Quality and Liquidity.

Capital Adequacy

It is the magnitude which decides the financial institution`s ability to meet its obligation. It is the Total Equity over its Total Asset. In other words, it identifies the adequacy of banks` total working capital relative to it adverse risk that may come up from it asset portfolio. As argued by Anbar (2011) when the capital ratio is high, the lower the demand of owner equity whereas this this boost the bank to be more profitable. In this regard it is admitted that capital adequacy requirement is determined as a measure of a bank risk weighted asset (Omotola, 2011).

Asset Quality

Asset quality of a financial firm represents great asset depository institutions to agree to keep a proportion of its total assets. It is also identified as tangible and intangible assets for a bank. They can be liquid and real estate assets. It is computed when taking loans all over total asset. The high ratios of loan expose the bank to risk of failure particularly when the non-performing loan increases. Considering the loan,

when it increases this can cause the total asset to decrease. In the case of Ghanaian bank during the economic meltdown their loan and the government pressure with most banks indicate high responsiveness toward financial distress. The Non-performing loan increases during that period which causes the bank's insolvency.

Management Quality

It is found from the interest income over interest expense. Management has to adopt a forward looking component for instance variety in the bank strategic program. It is significant for the supervisory board to analyze the bank current and future capital demand in line of its strategic operation objectives. The management should obviously streamline and define the short and long run capital needs and future expenses. Sound capital budgeting must be performed as bank strategy plan process (Reserve Bank, New Zealand, 2007). It exhibits how well a financial institution manages his internal capital plus debt management, since banks aim to get more benefit than spending.

Liquidity

Establishing an insight from the past studies by (Peter S. Rose et al, 2005), they note that if the liquidity supply outperform the entire liquidity demand, the bank experience the liquidity surplus. To stress more on the higher liquidity which signify there is less profitability of bank failure and cause extreme trust and assurance to the investor to be persuaded. On the other hand, liquidity surplus can also be observed as inadequate financial behavior and consequently increase the bank failure. A richer understanding of liquidity measure is cash over total asset.

External factors: they are macroeconomic factors including, inflation and the growth rate (GDP).

Inflation Rate

It is the percentage change in the general price index; it causes the decline of a currency. A possible increase on the inflation could involve the policy maker to inject more money; likewise as inflation increases it affects the lending policy of the bank that will decrease drastically (John H. Boyd et al, 2000). To illustrate the inflation rate equation, it is the change of the price during a specific period generally a year subtract the last year (P1) to the current year (Po) and all over the price of the last or previous year (P1), and then times hundred (100). Central bank needs to defend the monetary policies which in turn mitigate the inflation. The central bank could raise the rate of interest, which will reasonably lead the borrowing to be greatly expensive; this result household to spend less likewise it reduces the investment.

Economic Growth Rate of GDP:

It expresses to build an insight of different changes for a country gross domestic product observed during a year.

4.4 Dependent Variables

Return on equity (ROE) and return on asset (ROA) which represent and offer a fitted picture of firm's performance and profitability expose some fundamental little differences.

Return on Equity (ROE): is one of the key ratios which are overlooked by any investor. It gives a clear idea when an institution yields profit or income through it available assets. It displays if the management is doing well with a satisfactory rate. The ROE also unfold how successfully bank is using its asset (stock) of his owners (Neceur and Gaied, 2001) and it obtained by dividing Net Income over the Bank Total Equity.

The following is the estimated equation:

$ROE_{i,t}=\beta 0+\beta 1(CAR_{i,t})\ \beta 2(ASQ_{i,t})+\beta 3(EFF_{i,t})+\beta 4(LQR_{i,t})+\beta 5(INF_{i,t})+\beta 6(GRT_{i,t})+\varepsilon t_{i,t}$

Where: Y= dependent variable β0= intercept β (1-6) = slope εt= error term or disturbance term i= cross section value, t= time period

Return on Asset : (ROA) is considered as a reliable variable of bank profitability signals, ROA exhibit the most fullest view in the financial enterprise as it reflect the bank qualities and power to raise maximum revenue (Marijana Curak et al , 2012). The ROA is a crucial bank dynamic measure that causes to be closely linked to bank profitability[3]. (Kosmidou, 2008) strongly observed that when the ROA increase it exhibits or announces the increases on bank profit.

In sum, to calculate the ROA we mostly consider the Net Income divided by the Total Asset.

The following are the estimated equation:

$ROA_{i,t}=\beta 0+\beta 1(CAR_{i,t})+\beta 2(ASQ_{i,t})+\beta 3(EFF_{i,t})+\beta 4(LQR_{i,t})+\beta 5(INF_{i,t})+\beta 6(GRT_{i,t})+\varepsilon t_{i,t}$

Where: Y= dependent variable β0= intercept β(1-6)= slope εt= error term or disturbance term i= cross section value t= time period

[3] KOSMIDOU, 2008: The determinant of bank profit in Greece during the period of E.U financial integration. Managerial Finance 34(3). 146-159.

4.5 Methodology

This empirical study would be carried out by using a balanced panel data approach of Ghanaian commercial banks. To best measure our model analysis, statistical programs will be used through the support of the E-views and the Excel software program. To explain the variation of the change from the variance, autocorrelation and others estimated variable, the Unit-root test witnesses that parameters are stationary and this help us to conduct analysis using the simple regression analysis, since data demonstrates stationarity. Further, in our analysis we use the Ordinary Least Squared (OLS), which will be used to appraise the profitability of the banks in Ghana. The OLS is a linear least square for estimating the unknown parameters in a linear regression model. It minimizes the sum of squared vertical distances between the observed responses in the dataset and the responses predicted by the linear approximation. The OLS estimator is consistent when the regressors are exogenous and there is no perfect multicollinearity. Under these conditions, the method of OLS provides minimum-variance mean-unbiased estimation when the errors have finite variances.

The econometric structure of the panel regression is:

$$\mathbf{Y}_{i,t} = \boldsymbol{\beta}\mathbf{0} + \boldsymbol{\beta}\mathbf{X}_{i,t} + \boldsymbol{\varepsilon}\mathbf{t}_{i,t}$$

Where:

$\mathbf{Y}_{i,t}$ correspond the dependant variables

β0 interpret the intercept.

X stand for the independant value

ε Act as the error term in the model.

i represent the cross section value (1 to 7)

t stand for the time period.

Hence, the model Analysis will be:

$\mathbf{X}_{i,t}$ = (CAR, EFF, LQR, INF, GR) $_{i,t}$

Y $_{i,t}$ = (ROE, ROA) $_{i,t}$

The estimated profitability equation can be demonstrated as :

$$ROE_{i,t} = \beta0 + \beta1\ (CAR\ i,t) + \beta2\ (EFF\ i,t) + \beta3\ (LQR\ i,t) + \beta4\ (INF\ i,t) + \beta5\ (GRT\ i,t) + \varepsilon t_{i,t}$$

$$ROA_{i,t} = \beta0 + \beta1\ (CAR)_{i,t} + \beta2\ (EFF)_{i,t} + \beta3\ (LQR)_{i,t} + \beta4\ (INF)_{i,t} + \beta5\ (GR)_{i,t} + \varepsilon t_{i,t}$$

Chapter 5

EMPRICAL ANALYSIS AND RESULTS

In this section, we analyze all the selected banks` financial position and their profitability performance considering each variables as standard measure. The bank performance ratios information is supplied from the bank balance sheet and the income statement of individual bank. For a comfortable view, it prospects the performance movement (trend) in the industry, the calculated ratio have been employed to a yield of some results from the regression analysis.

The regression analysis emphasize the relationship between bank efficiency and the selected variables. Interestingly, from the methodolgy analysis, we found the F-Statistic highly significant according to the hypothesis (0.000) and this probability show a strong evidence to reject H null (H0) and accept the alternative hypothesis

(H1). In other words, the model is more fitted to measure the effect of bank-specific and macro-economic factors for ROE and ROA. This can be experienced once the probability (α) is comparatively lesser than the significance level known as (0.01%, 0.05%, and 0.10%). Radical shift or change can be noticed signifying that we can accept (H0) reject (H1) if stationarity is negative.

5.1 Correlation Analysis

Correlation Analysis evaluate the relationship between two (2) different variables it limits in the range of - 1 to + 1. In this case, we will look at the relationship among both dependant and independant variables by analyzing the coefficients of F-statistic, R-squared, Durbin Watson for autocorrelation heteroskecedasticity and multicolinearity test.

Table 4: Correlation matrix

	LROA	*LROE*	*LCAR*	*LASQ*	*LEFF*	*LLQR*	*LINF*	*LGRT*
LROA	*1*							
LROE	*0.518*	*1*						
LCAR	*0.587*	-0.386	*1*					
LASQ	*0.291*	0.032	0.284	*1*				
LEFF	*-0.524*	-0.314	-0.268	0.002	*1*			
LLQR	*0.631*	0.178	0.511	0.306	-0.351	*1*		
LINF	*-0.095*	0.013	-0.127	-0.146	-0.043	-0.007	*1*	
LGRT	*0.043*	0.001	0.060	0.135	0.047	0.020	**-0.714**	*1*

As we can observed from the table above, the relationship between indepent and independent variables displayed a weak correlation, however, there is a strong correlation of the logarithm of the inflation and the logarithm of the GDP growth negatively with a range of -0,71 units. Moreoer,we can see that there is a strong and positive correlation between Log ROA and Log LQR in the range of 0,63.

Also, the analysis as it can be seen from the table indicates that LCAR, and LEFF are negatively related ith ROE, whereas the LLQR, LASQ,LINF and LGDP display a positive correlation with ROE . LLQR remains as unique variable which both correlate with LROE and LROA and it has been also pictured that LINF and the LEFF have negative relation with LROA and this describes that banks which trust on external factors like LGRT , in order to raise funds that can be considered as low profitable and less efficient banks. Interestingly, it is observed that inflation and the GDP are not significant with a negative coefficient which hit negatively the profitability of the bank with the measurement of balancing a price, we bear in mind that there will not be an earning or profit either LROE and LROA. The significance of LCAR better explain that investors funds will increase and promote its assets and that reasonably pull in more client toward the bank and push up the income. According to the regression test , LEFF, LCAR are perfectly negative in regards to ROE and that affect negatively our model. When EFF tend to increase which push ROE to drastically go down by -0.314 units, alongside, with LCAR when it increases by 1 unit LROE decrease by -0,386 units.

5.2 Regression Analysis

From the use of E-view in this model we coordinate both independant variables (LCAR, LASQ,LEFF, LLQR, LINF and LGRT) and their relationship on dependant variables (LROE and LROA),we will demonstrate which of the key variables, the coefficient estimation are significant.

5.2.1 Regression for LROE

Looking up the table (Panel Unit Root Tests) in the appendix, the analysis indicated that there were a real minimum meaning on LROE than LROA. We detected LASQ is more significant at 0.5% . and the R-Squared is 0,63 % which means the bank specific and macroeconomic factor is effective by 0.63 % for ROE and the remain 37 % which can be observed from others varables affecting profitability factors (LROE and LROA) in Ghana and those 37% are not needed in our test. Regarding the F-Statistic, it probability we got in the model is highly fitted and working thoroughly because the P-value is less as compare to the level of signicance (α) in the hypothesis. LASQ is one of the most reliable factor that can influence profitability and significant at level 0.5% and that shape LROE to be positive. LCAR negatively affect LROE at 10 % which can intend that Ghanaian bank experiences shortage of capital.

Similarly, LEFF has negative effect on LROE at level 0.5% and 10% this result weaknesses of banks in which they maybe experiencing spending more than earning.

5.2.2 Autocorrelation Problem

From the result gotten from Durbin-Watson considered as a major tool for correlation problem and the result show that Durbin-Watson is 1.89 and this explain that there is no autocorrelation and heteroskedacity problem. Regarding its assumption, the value must be from 1.50 to 2.50 and our case 1,89 is more significant, so we experience no autocorrelation error in our model and whereas we also understand from F-Statistic that the model don't have autocorrelation problem.

Table 5: Regression Analysis for ROE[4]

Variables	Coefficient	Std. Error	t-Statistic	Proba
C	-3.002056	0.731897	-4.101745	0.0002
LCAR	-0.608619	0.100185	-6.074925	0.0000
LASQ	0.188195	0.106400	1.768746	0.0854
LEFF	-0.294749	0.174760	-1.686591	0.1003
LLQR	0.248179	0.053970	4.598452	0.0001
LINF	-0.235268	0.184014	-1.278533	0.2092
LGDP	-0.065133	0.198872	-0.327515	0.7452
R-squared	0.631848			
F-statistic	5.148813			
Prob(F-statistic)	0.000061			
Durbin-Watson	1.890743			

5.2.3 Regression for LROA

Testing the analysis with LROA showed that the independent variables have very minimal significance on LROA. We found the LGRR(Growth rate) significant at 0.0882***. The C (error term) was also significant at 23.4555** which meaning the error term is limited. Also the R-squared was 0.71 meaning all independent variables has 71% effect on the profitability of LROA. In this case we focus on LROE because the probability of the F- statistic of LROA was 0.000, which is still significant at levels.

[4] Regression Analysis Result for ROE is available in Appendix.

Table 6: Regression Analysis for ROA[5]

Variables	Coefficient	Std. Error	t-Statistic	Proba
C	-3.127893	0.673865	-4.641720	0.0000
LCAR	0.389189	0.098732	3.941865	0.0004
LASQ	0.191627	0.107067	1.789779	0.0819
LEFF	-0.295863	0.172341	-1.716733	0.0946
LLQR	0.245577	0.056051	4.381334	0.0001
LINF	-0.236995	0.184300	-1.285920	0.2067
LGDP	-0.106456	0.187921	-0.566493	0.5746
R-squared	0.715456			
F-statistic	7.543170			
Prob(F-statistic)	0.000001			
Durbin-Watson	1.870393			

[5] Regression Analysis Result for ROA is available in Appendix

Chapter 6

CONCLUSION AND RECOMMENDATION

As with most developing countries, Ghana's banking industry in recent year has grown at a fast pace by increasing the number of operating bank across the country.A core objective of this study was to empirically analyze the determinant of bank efficiency in Ghana based on a selected seven (7) commercial bank during 2005 and 2011. We employed a panel regression analysis to test some variables affecting the profitability ratio LROE and LROA. There have been related research carried by (Anthony Koffi Krakah at al, 2010) they stress on determinant of bank profitability using the regression analysis to judge the profitability of merchant banks and they find that LGRT and LINF were main variable for banks profitability in Ghana, they also defend that bank size, loan losses did not experience and effect on profitability. Also, (Khizer Ali et al, 2011) examine the bank specific and explored between 2006 – 2009 using LROA, LROE as profitability indicator they come out that LINF, the operating efficiency have high impact on ROE indicator of pakistanese banks, some ratio showed level of significance from the study.

In this specific study, Ghana commercial bank used LROE as hypothesis testing, LASQ and LLQR were positively linked which determine that asset quality can influence efficiency better than other insignificant variable.

Regarding the LGDP and the Inflation which are the critical point but not significant with negative coefficient, they perfectly affect the bank profitability. In this regard,

we can judge that the performance of banks tend to be exposed from some macroeconomic indicators compare to others sub-saharian bank as mentioned by (IMF country report, 2011) states that many sub-saharian countries are more profitable than other region in the world either measure by ROE or ROA.

The major concern here is that Ghana is part of these sub-saharian countries which sometime banks and affiliate or branches are interconnected to each other, why the case of Ghana they make some losses.

The finding from this study is that LGRT, LINF, LASQ, LEFF and LCAR are considered to be best fitted as central measure of bank efficiency. Therefore, concentrating and reorganizing the concern on the management with those negative factors may increase the level of profitability and improvement of these banks. Although, the LGDP, and inflation which determine the current states of the economic forces has not highly affected and changed the country financial system though there are many others forces compiled to the help of country growth, the banking sector do not significantly affect economic environment.

Finally, I suggest that bank management should have a strong concern on the overall macroeconomic variable while considering the exogenous and endogenous indicators about banking development; they must look at significantly macroeconomic surrounding for better profit.

Internally, the rate of high asset risk project or business should be considered by bank management.

Externally, a relevant policy should be made by the government to better improve the inflation and GDP this may increase the profitability of banks.

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APPENDIX

Table 7: Panel Unit Root Tests for Ghanaian banks

Variables		*Levels*		
		LLC	*IPS*	*M-W*
LROA	τ_T	-8.27553*	-0.51086	42.1585*
	τ_μ	-4.12251*	-1.54740**	25.2210**
	τ	0.73065	-	11.7659
LROE	τ_T	-4.52932*	0.03011	22.6775**
	τ_μ	-3.49617*	-0.54768	27.66**
	τ	-2.40346***	-	20.3136
LCAR	τ_T	-5.26105*	0.18825	26.4295**
	τ_μ	-1.97619**	-0.01901	15.0382
	τ	0.02043	-	10.8154
LASQ	τ_T	-9.77647*	-0.71752	48.5210*
	τ_μ	-4.53951*	-1.81700**	38.4012*
	τ	-1.29747***	-	31.2353*
LEFF	τ_T	-3.11467*	0.33398	20.1212
	τ_μ	-0.20257	1.07666	8.94675
	τ	-0.87749	-	16.8235
LQR	τ_T	-10.7234*	-0.75706	40.4053*
	τ_μ	-5.02612*	-1.02152	22.4917***
	τ	-1.35908***	-	21.0033
LINF	τ_T	-1.31453***	0.96666	0.83380
	τ_μ	-1.80467**	0.30631	3.78896
	τ	1.26929	-	1.34073
	τ_T	-2.21534*	0.71259	0.91822

LGRT	τ_μ	-0.80133	0.22675	2.62577
	τ	-2.30876	-	23.4555**

Note

LROE represents the Logarithm form of the return on equity; LCAR is a log of capital adequacy; LEFF is a log of management quality; LLQR represents the log of the liquidity, etc... τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Optimum lengths are selected based on Schwartz Criterion. *, **, *** denote rejection of the null hypothesis at the 1%, 5%, 10% levels. Tests for unit roots have been carried out in E-VIEWS 6.0.

Table 8**: Regression Analysis Result for LROE**

Dependent Variable: LROE
Method: Panel Least Squares
Date: 01/27/13 Time: 22:18
Sample: 2005 2011
Periods included: 7
Cross-sections included: 7
Total panel (balanced) observations: 49
White period standard errors & covariance (no d.f. correction)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.002056	0.731897	-4.101745	0.0002
LCAR	-0.608619	0.100185	-6.074925	0.0000
LASQ	0.188195	0.106400	1.768746	0.0854
LEFF	-0.294749	0.174760	-1.686591	0.1003
LLQR	0.248179	0.053970	4.598452	0.0001
LINF	-0.235268	0.184014	-1.278533	0.2092
LGDP	-0.065133	0.198872	-0.327515	0.7452

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.631848	Mean dependent var	-1.873288
Adjusted R-squared	0.509131	S.D. dependent var	0.908929
S.E. of regression	0.636814	Akaike info criterion	2.157634
Sum squared resid	14.59917	Schwarz criterion	2.659545
Log likelihood	-39.86203	Hannan-Quinn criter.	2.348058
F-statistic	5.148813	Durbin-Watson stat	1.890743
Prob(F-statistic)	0.000061		

Table 9**: Regression Analysis Result for LROA**

Dependent Variable: LROA
Method: Panel Least Squares
Date: 01/27/13 Time: 22:21
Sample: 2005 2011
Periods included: 7
Cross-sections included: 7
Total panel (balanced) observations: 49
White period standard errors & covariance (no d.f. correction)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.127893	0.673865	-4.641720	0.0000
LCAR	0.389189	0.098732	3.941865	0.0004
LASQ	0.191627	0.107067	1.789779	0.0819
LEFF	-0.295863	0.172341	-1.716733	0.0946
LLQR	0.245577	0.056051	4.381334	0.0001
LINF	-0.236995	0.184300	-1.285920	0.2067
LGDP	-0.106456	0.187921	-0.566493	0.5746

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.715456	Mean dependent var	-3.869619
Adjusted R-squared	0.620607	S.D. dependent var	1.037953
S.E. of regression	0.639325	Akaike info criterion	2.165505
Sum squared resid	14.71453	Schwarz criterion	2.667416
Log likelihood	-40.05486	Hannan-Quinn criter.	2.355929
F-statistic	7.543170	Durbin-Watson stat	1.870393
Prob(F-statistic)	0.000001		

Table 10**: Graphical Presentation of all variable showing stationarity**