Effects of Non-Performing Loans on the Profitability of Commercial Banks - A Study of Some Selected Banks on the Ghana Stock Exchange

By Michael Nyarko-Baasi
Methodist University College

Abstract- The aim of this study was to establish the effect of non-performing loans on profitability of four of the major banks listed on the Ghana Stock Exchange (GSE) as this could enhance profitability in banks and consequently contribute to a healthy financial system. Panel regression analysis was employed to establish the relationship between credit risk and profitability in order to account for heterogeneity among selected banks; Standard Chartered Bank (SCG), ECO Bank Ghana (EBG) Ghana Commercial Bank (GCB) and Cal Bank (CBG) for a data span of 2006 to 2015. By the use of Eveiws, the analysis was conducted based on fixed effects model and Correlated Random fixed effects - Hausman test.

The study proxied return on equity (ROE) for profitability - dependent variable. Non-performing loan ratio (NPLR) and capital adequacy ratio (CAR) were the two key explanatory variables. The study revealed that NPLR negatively affect profitability of banks but rate of CAR showed a significant positive relationship with profitability. Bank Size equally showed a positive relationship with profitability. The R² explained 89 % of the variations on profitability performance of the banks. Managers of banks are to comply strictly with the rules that regulate the operations of banks in Ghana especially on the issue of capital adequacy ratio. Banks should also be cautious on the rate they expand since bank size can equally affect the fortunes of banks. The central bank must also be up and doing to ensure that banks keep- to all ratios set down by the Central Bank, the banking regulations and the various bards.

GJMBR-C Classification: JEL Code: H81, D00

Strictly as per the compliance and regulations of:

© 2018. Michael Nyarko-Baasi. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.
Effects of Non-Performing Loans on the Profitability of Commercial Banks - A Study of Some Selected Banks on the Ghana Stock Exchange

Michael Nyarko-Baasi

Abstract- The aim of this study was to establish the effect of non-performing loans on profitability of four of the major banks listed on the Ghana Stock Exchange (GSE) as this could enhance profitability in banks and consequently contribute to a healthy financial system. Panel regression analysis was employed to establish the relationship between credit risk and profitability in order to account for heterogeneity among selected banks; Standard Chartered Bank (SCG), ECO Bank Ghana (EBG), Ghana Commercial Bank (GCB) and Cal Bank (CBG) for a data span of 2006 to 2015. By the use of Eviews, the analysis was conducted based on fixed effects model and Correlated Random fixed effects - Hausman test.

The study proxied return on equity (ROE) for profitability - dependent variable. Non-performing loan ratio (NPLR) and capital adequacy ratio (CAR) were the two key explanatory variables. The study revealed that NPLR negatively affect profitability of banks but rate of CAR showed a significant positive relationship with profitability. Bank Size equally showed a positive relationship with profitability. The R² explained 89 % of the variations on profitability performance of the banks. Managers of banks are to comply strictly with the rules that regulate the operations of banks in Ghana especially on the issue of capital adequacy ratio. Banks should also be cautious on the rate they expand since bank size can equally affect the fortunes of banks. The central bank must also be up and doing to ensure that banks keep to all ratios set down by the Central Bank, the banking regulations and the various bards.

I. Introduction

Industry in Ghana has been driven largely on credit facilities from the banks and other financial sectors in the Ghanaian economy and has played a pivotal role in our socio-economic development, (Hamisu ,2011). The banking industry has to be applauded for this prominence and influential role. This means that the other industries in Ghana have depended mostly on the financial sector especially the banks for various financial supports and this has contributed to the survival of the Ghanaian economy.

However, many banks in Ghana today are making huge losses due to the problem of non-performing loans in their books. The possibility of a bank to make losses as a result of loans defaults by debtors often happens in the financial sector especially banks. This is clearly a negative effect against the intermediary role the banks play towards the growth of the economy. The rate at which these institutions give credit to businesses and some individuals step up the pace of economic growth of the nation (Kolapo, Ayeni, Oke, 2012).

Ghana banking system is regulated and monitored by the bank of Ghana with the Banking Act made by the parliament of Ghana. The Acts has regulations which guide the activities of all banks and some other financial institutions in the country. Unfortunately, records show that profits in the sector fell sharply in the years 2005 to 2007 to numerous reasons amongst the non-performing loans ratio (NPLR) on the books of most banks but however saw a better liquidity and profitability performance at the close of 2009 (Bank of Ghana, 2012).

Financial institutions all over the world face several risks of nonperforming loans, it is however prudent for these institutions to introduce monitoring mechanisms to follow up with the activities of borrowers. It is well noted that importance of credit risk management has increased particularly in the developing countries for both lenders and borrowers. It is a fact that average bank asset quality worsened sharply due to the global economic meltdown. It is argued however that the poor performance of loans was very uneven in a number of countries. It is also established that a number of variables significantly affect NPL ratios which includes but not limited to lending interest rate, share prices and some risk factors. Non-Performing Loans is the possibility of a borrower defaulting an unpaid loan either partly or in full (Basel Committee on Banking Supervision, 2001). This is in line with Ahmad and Ariff (2007), who stated that NPL is a percentage of loans that are not repaid within three months. The committee further emphasized on credit risk management practices due to the rise of NPLs which is unfavorable to banks achievement of core targets.

Balasubramaniam (2013) outlined some effects that NPLs can have on bank’s activities. He argued that
dealing with NPLs takes essential part of management’s
time and effort to the detriment of other essential
activities of the bank since management could have
engaged in fruitful activities to bring good return with the
time and effects wasted on NPLs. The author further
mentioned that banks do not earn interest income on
NPLs and end up losing asset but also waste money to
institute specialised departments and hired specialised
financial engineers to deal with NPLs. According to
Balasubramaniam (2013) NPLs in addition, block
income which compels banks to borrow and these
results in additional cost to the bank, hence a
reputational risk to the bank. If a bank faces NPL
problems, it negatively affects its good standing,
merging with other institutions to take advantage of
better business opportunities.

The study of the impact of credit risk on banks
is important because they affect the financial
intermediation role of commercial banks which is a core
source of income to the banks and ultimately, the
financial stability of an economy (Klein, 2013). In this
regard, NPLs have gradually drawn attention with the
recognition that a result of huge NPL ratios on the books
of banks shows clearly the level of inactivity of the
economy. This is largely because commercial banks
measure their profit performance among other things by
the level of loan recoupment and failure to do so
explain that high percentages of NPLs are highly
 correlated with banks’ performances especially in
emerging economies. Fofack (2005) also associated
banks’ heavy accumulation of NPLs with profitability and
observed that the NPLs can heavily contribute possible
financial distress.

Ghana Banking Survey conducted in 2013
showed that most commercial banks in Ghana are
facing huge bad loans, a situation the central bank
considered as serious because key banks such as
Standard Chartered Bank (SCG), Eco Bank Ghana
(EBG), Ghana Commercial Bank (GCB) and Cal Bank
(CBG) were not spared. The report did not however
indicate the actual outcomes of it but other proofs
suggest that bad loans adversely affect the banks’
financial condition.

According to Karim, Chan and Hassan (2010),
the main effect of bad loans is the ability to hinder the
bank to grow financially. This is because bad loans drag
banks into liquidity problems and make them unable to
extend funds to other potentially viable businesses. Karim et al. also maintained that the banks cannot take
up some procreative investment opportunities because
of locked up capital due to bad loans and makes banks
experience shortfalls in revenue generation.

Ensuring strong credit risk management for
building quality loan portfolio is of paramount
importance to robust performance of commercial banks
as well as overall economy (Charles and Kenneth,
2013). The growing stock of literature in finance and
economics underscores that failure in credit risk
management is the main source of banking sector
crises which possibly leads to economic failure
experienced in the past including 2008 global economic
financial crises (Fofack, 2005; Onaolapo, 2010). Loan
portfolio constitutes the largest operating assets and
source of revenue of most financial institutions.
However, some of the loans given out become non-
performing and adversely affect the profitability and
overall financial performance of the lending institutions. Many lending institutions in Ghana are confronted with
the challenge of rising non-performing loan portfolios
despite efforts at stemming the tide.

This work sought to investigate extensively
into how NPL can affect commercial banks profitability
performance in Ghana. Thus, this work aims to establish
whether non-performing loan has an effect on
profitability.

a) Empirical Review

The effects of non-performing loans on
profitability levels of commercial banks do not occur in a
vacuum. Olawale (2014) studied how commercial banks
in Nigeria performances are affected by credit risk
during the period of 2008 to 2012. The study used a
secondary data collected from the companies audited
annual accounts published in their websites and also
from the publication of the Central Bank of Nigeria. OLS
method of analysis was employed. Profitability was
measured with ROA as a function of NPLR and Loan
and Advances ratio (LA/TD). The author’s results show a
negative relationship but not significant between loan
ratio and total advances in terms of deposits and further
shown a significant negative relationship between non-
performing loans and advances rate and banks’
profitability. The paper further mentioned that banks
profitability could be affected inversely by the levels of
non-performing loans and advances, thus affecting
greatly the banks’ liquidity.

Wangai et al., (2014) also examined how the
Financial Performance of Kenyan Microfinance Industry
has been impacted by Non-Performing Loans and the
effects on the survival of small and medium enterprises.
This study aimed at establishing how far microfinance
banks (MFBs) in Nakuru, Kenya have been affected by
non-performing loans over a period of time. They used
primary data which was collected from the respondents
with a structured questionnaire. The paper analyzed
data collected both descriptively and inferentially. It was
established that risk associated with credit significantly
affected MFBs in Nakuru town’s financial performance.
The authors further concluded that, increase in credit
risk would significantly reduce the financial performance
of the MFBs.
Gizaw et. al. (2015) also in their paper examined how far the profitability performance of commercial banks in Ethiopia has been affected by risk associated with credit. The study used a secondary data collected from the companies' respective audited annual accounts published in their websites and also from the publication of the Central Bank of Ethiopia. The authors were collected from eight commercial banks from a period of twelve year (2003 to 2014). The data was then analyzed using descriptive statistics. Their results showed that variables such as non-performing loans, loan loss provisions and capital adequacy which were used as proxy for credit risk had a significant impact on commercial banks profitability performance in Ethiopia. A panel data model was adapted by the paper in line with Kolade et al. (2012). Return on Asset (ROA) and Return on Equity (ROE) were used by the paper as the indicators of profitability performance. The study recommended that commercial banks in Ethiopia need to institute policies and programmes to check credit risk to ensure their profitability and survival.

Chimkono et al (2016) carried out a study that was intended to examine the relationship that exists between non-performing loan ratio and other factors and financial performance of commercial banks in Malawi covering a 7-year period from 2008 to 2014. Correlation research methodologies and multiple regression analysis were adopted. Census study applications were used to collect secondary data from the audited financial statements of 10 commercial banks. In this study, financial performance was measured in terms of return on assets (ROA) while non-performing loans (NPL) was measured as the NPL ratio (which was calculated as a percentage of non-performing loans to gross loans, thus Gross NPLs/ Gross loans). It was discovered that non-performing loan ratio, cost efficiency ratio and average lending rate significantly affected bank performance whereas cash reserve ratio directly associated with performance but was insignificant. The authors suggested that the monetary authorities should provide specific support systems to the banking sector and the banks themselves must provide innovations that would enhance their operations.

Bentum (2012) conducted empirical assessment of the determinants of profitability of commercial banks in Ghana during the global financial rises. To address the research problem, the study aimed at evaluating the impact of bank-specific factors, industry characteristics and macroeconomic factors on profitability in the commercial banking sector in Ghana. Secondary data from the annual reports of the banks for 10 years from 2001 to 2011 were used. Multiple linear regression in the form of fixed effect model (FEM) was used. The dependent variable, ROA was used as a proxy for profitability whereas internal and external factors were used as independent variables. The study reported that profitability was determined by bank-specific variables, industry factors as well as macroeconomic factors. Bank factors that influence profitability, according to the study are capital and reserve to total assets, non-interest income to gross income ratio and the natural log of total deposits. Macroeconomic factors that affected profitability during the study period were real GDP growth rate, annual growth rate of inflation and annual growth rate of money supply.

Ali (2015) conducted an investigation into the effects of credit risk management on the financial performance of commercial banks in Jordan during the period 2005 -2013. The purpose of the study was to examine the influence of credit risk management indicators (such as capital adequacy ratio (CAR), ratio of non-performing loans to gross loans (NPL/GL), ratio of credit interest to credit facilities (CI/CF), leverage ratio and the ratio of facilities loss to net facilities (FL/ NL)) on financial performance (profitability) of commercial banks. Profitability was measured by ROA and ROE. Panel regression in the form of pooled least squares and correlation analysis was carried out along with descriptive statistics. Stationarity of the variables was tested with the ADF. Secondary data from the annual reports of 13 banks were used and analyzed. Empirical findings indicate that the ratio of non-performing loans to gross loans positively related to financial performance and an inverse relationship was found between the ratio of facilities loss to net facilities and financial performance but no impact of CAR and CI/CF on financial performance was recorded. The study recommended an improvement in the credit management procedures through an establishment of appropriate policies.

Nkegbe & Yazidu (2015) investigated the trends and determinants of bank performance in Ghana. Panel data regression models were estimated for analysis along with trend graphs and equations. Secondary data from the annual reports of 27 banks covering the period 2000-2010 were used for the study. Performance which was represented by profitability was measured in terms of ROE, ROA and NIM (Net Interest Margin). Among the independent variables used as determinants of profitability were liquidity, non-performing loans (NPL), bank size (MSL) and operational efficiency. The study reported a negative trend in bank performance and a positive relation between market of loan and bank performance. Macroeconomic factors that the study cited as drivers of profitability were GDP, CPI and broad money supply (M2+). Results further indicated that liquidity, market share of loans and operational efficiency had a positive association with all profitability indicators. But NPL was reported as having negative relation with ROE and ROA. Provision of training to the informal sector on financial statement preparation was suggested as a means of dealing with NPL.
Beck et al (2013) conducted an empirical study on the determinants of non-performing loans (NPL) in seventy-five countries in a dynamic panel regression, fixed and random effects framework. Secondary data set for the period 2000-2010 was used. The ratio of NPL to gross loans was used as the dependent variable. Empirical results indicate that real GDP growth, share prices, exchange rates and lending rates significantly influenced NPL. Of these factors, real GDP growth was mentioned as the main driver of CR.

Asantey & Tengey (2014) studied the effects of bad loans on banks’ lending ability and financial performance using secondary data from the annual reports of four listed commercial banks (Eco bank, GCB Bank, CAL Bank, and Agricultural Development Bank) for a-5 year period covering 2008 to 2013. The aim of the paper was to examine the effects of bad loans on the lending ability and net profit (return on investment) of the banks. Pearson correlation test and OLS were used to examine the data. The study discovered a high negative correlation between bad loans and lending ability at 0.05 alpha level and a high negative correlation between bad loans and financial performance, measured as return on investment or net profit at 0.05 level.

II. Material and Methodology

The study uses positive quantitative research paradigm which is appropriate because it enables the capturing of knowledge through measurements of phenomena in which mathematical and statistical procedures are used to describe, predict and explain behavioral phenomena (Krasususes, 2005). The study is basically a quantitative research that aimed at examining the effect of non-performing loans on the profitability of commercial banks as it involves the collection and analysis of audited financial reports using statistical methods. The use of statistical modeling enables the researcher estimate and establishes the existence of causal relationships between the variables of interest.

The study used secondary data that span from 2009 to 2016. Annual time series data for each of the variables; return on equity (ROE), Non-Performing Loan Ratio (NPLR), Bank Size (BS) and Capital Adequacy Ratio (CAR) were sourced from audited annual financial reports of the Standard Chartered Bank (SCG), Eco Bank Ghana (EBG) Ghana Commercial Bank (GCB) and Cal Bank (CBG). Data on consumer price index used as a proxy for inflation (INFL) was obtained from the Ghana Statistical Services annual bulletin. The choice of these variables was informed by literature on the effect of non-performing loans on the profitability of commercial banks in Ghana.

a) Model Specification

With the central aim of investigating the effect of non-performing loans on the profitability of commercial banks understudy, the present study followed a panel data model employed by Gizaw et al. (2015) in their investigation of the impact of credit risk on profitability performance of commercial banks in Ethiopia. This study added inflation (INFL) as a control variable to the model to capture the role of price volatility on profitability of banks. Profitability (ROE) is therefore stated as a function of NPLR, CAR, BS and INFL and it is expressed mathematically as:

\[
ROE = f (NPLR, CAR, BS, INFL)
\]  

(1)

The regression models are thus formulated as

\[
P_1 = \beta_0 + \beta_1 NPLR_i + \beta_2 CAR_i + \beta_3 BS_i + \beta_4 INFL_i + \varepsilon
\]  

(2)

From equation (2): \(P_1\) refers to profitability measured by ROE; \(\beta_0\) is a constant term; \(\beta_1, \beta_2, \beta_3\) and \(\beta_4\) are coefficients of explanatory variables to be estimated; \(NPLR_i\) refers to non-performing loan ratio, \(CAR_i\) represents capital adequacy ratio, \(BS_i\) represents bank size \(INFL_i\) represents the rate of inflation and \(\varepsilon\) is the error term assumed to be normally and independently distributed with zero mean and constant variance, which captures all other explanatory variables which impact profitability but were not captured in the model.

Return on equity (ROE) refers to the proportion of net income to total equity. Total equity is the amount of funds invested by owners (shareholders) of a company. ROE is calculated as net income divided by total owners’ equity and it gives an indication of the rate of return made by owners’ equity. Thus, it is a financial ratio that compares the earnings attributable to ordinary shareholders with the book value of their investment in the business. A higher value of ROE means that the company has the ability to generate cash internally and the better for the company in terms of profit generation. ROE has also been extensively used in the literature as a measure of how profitable it is for investors (shareholders) to invest their funds in companies (Hassan & Bashir, 2003).

Non-Performing Loan Ratio (NPLR) is the ratio of non-performing loans to total loans and advances. It is one of the major indicators of credit risk and a measure of credit quality and it shows the proportion of total loans and advances that are in default or overdue for more than 90 days. Some studies have reported a negative linkage between NPLR and profitability (see for example Nkebe and Yazidu, 2015; Gizaw et al., 2015;
Chimkono et al., 2016 and Olawale, 2014). A negative relationship is therefore expected between NPL and profitability, thus, \( \beta_1 < 0 \).

Capital adequacy ratio (CAR) refers to the percentage of total owners’ equity and reserves that the banks are expected to hold against risky assets. It is meant to safeguard depositors against unanticipated losses. CAR is measured as tier 1 capital plus tier 2 capital divided by risk adjusted assets. Literature has shown that CAR can be negatively or positively related to profitability. For example Garba (2014) and Ali (2015), reported a positive and a negative relationship between capital adequacy ratio and financial performance respectively, Thus, \( \beta_2 < 0 \) or \( \beta_2 > 0 \).

Bank size (BS) is proxied for the book value of total assets of each bank. This representation was adopted from the empirical studies of Alper and Anbar (2011). Positive effect of bank size on profitability has been reported in the literature (see the works of Naceur (2003) whiles others such as Naceur (2003) have had a negative linkage. Therefore, \( \beta_3 < 0 \) or \( \beta_3 > 0 \).

Inflation (INFL) refers to the rate at which general price level rises in an economy in a year. The consumer price index is used as a proxy for inflation in this study. Accurate and precise prediction of inflation can have a positive impact on profitability and vice versa.

Effects of Non-Performing Loans on the Profitability of Commercial Banks - A Study of Some Selected Banks on the Ghana Stock Exchange

\[ Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it} \]  

Where \( Y_{it} \) is the dependent variable; \( \beta_0 \) is a constant term; \( X_{1} \) to \( X_{4} \) are the independent variables; \( \beta_1 \) to \( \beta_4 \) are slope parameters; \( i \ldots n \) refers to the cross-sectional units and \( t \) is the time period. Using this regression specification, the model for this study is thus written as:

\[ ROE_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 INFL_{it} + U_{it} \]  

Gujarati (2009) opined that pooled OLS regression model has the advantage of being the simplest, easy to understand and interpret as compared to the other models but the model is associated with some weaknesses. It assumes that cross-sectional units are homogeneous. This assumption may not be realistic. For example, the slope coefficients and intercept must be the same for all the banks that constitute cross-sectional units in this study. This may not be possible and it may be wrong to make this assumption. The error term is assumed to have taken care of the individual bank specific effects and the time components of data. Another weakness of pooled OLS regression may be the existence of autocorrelation in the model which results in errors and invalid conclusions.

iii. The fixed effect model (FEM)

The fixed effect model is highly comparable to the pooled OLS regression model in the sense that the

\[ Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it} \]  

\[ ROE_{it} = \alpha_i + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 INFL_{it} + U_{it} \]  

Where \( i \) in \( \alpha_i \) refers to the cross-sectional units representing the intercept values for each cross-sectional unit. Now, inserting the independent variables of this study into this model yields the following equations:

b) Method of Estimation and Testing

i. Panel data regression model specifications

Panel data can be estimated and analyzed in three different specification models. These are the correlation matrices, the Fixed Effect Model (FEM) and the Random Effect Model (REM). In this study, the fixed effect model is chosen over pooled OLS regression because of the advantages the former has over the latter.

ii. Pooled Regression Model

To obtain a reliable and unbiased estimate for analysis, this estimation method uses the classical linear regression assumptions which according to Albright, Zappe and Winston, (2011) stipulate that the error term should be independently and normally distributed with zero mean and constant variance and more importantly must not correlated with the independent variables. The pooled OLS linear regression is given as follows:

\[ y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{4it} + \beta_4 x_{5it} + u_{it} \]  

\[ ROE_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 INFL_{it} + U_{it} \]  

\[ Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it} \]  

\[ ROE_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 INFL_{it} + U_{it} \]  

\[ Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it} \]  

\[ ROE_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 INFL_{it} + U_{it} \]  

© 2018 Global Journals
Among other things, the fixed effect least-squares dummy variable (LSDV) approach is limited by its inability to deal with large samples. It has been stated that larger number of cross sectional units results in a bigger decrease in the degree of freedom (Hsiao, 2006). But Batalgi (2005), believes that this issue is solved with the use of the fixed effect within-group estimator methodology. This approach makes use of de-meaned values of variables to estimate associations. It also does away with large decreases in the degree of freedom associated with large samples. One central weakness of this model according to Hsiao, (2006), has to do with the issue of multicollinearity, which emerges in large samples of cross-sectional units. A linear relationship between two or more independent variables describes the concept of multicollinearity where standard errors are extremely higher hence estimations are distorted. Moreover, the FEM is able to deal with time variant variables only, compared to time invariant ones in estimating coefficients.

Table 1: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAR</td>
<td>0.306883</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>0.142691</td>
<td>0.174249</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPLR</td>
<td>0.286683</td>
<td>-0.001812</td>
<td>0.273259</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>0.541974</td>
<td>0.497600</td>
<td>0.014432</td>
<td>-0.055613</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

From table 1 above all the independent variables have weak to moderate correlation and therefore do not pose any problem of multicollinearity. Interestingly, NPLR is negatively correlated to ROE while CAR is positively correlated which satisfy the prepositions on the effects of NPLR and CAR on profitability. More so, ROE are highly positive correlated also fulfill the condition that ROE can be good proxy for profitability.

c) Fixed Effects Model

According to Batalgi (2005), the fixed effects model is akin to the pooled regression model in that it follows classic linear regression assumptions, and that its slope coefficients remain the same for the cross-section units under study. One of the advantages of the fixed effects model is that unlike the pooled regression model it considers heterogeneity among the cross-section units by giving a different intercept for each cross-section unit. In this study, the four banks have different intercepts.

Table 2: Fixed effects model: Dependable Variable (ROE)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-statistic</th>
<th>P-Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPLR</td>
<td>-2.071178</td>
<td>0.797842</td>
<td>-2.595975</td>
<td>0.0130*</td>
</tr>
<tr>
<td>CAR</td>
<td>-0.619268</td>
<td>0.436040</td>
<td>-1.420209</td>
<td>0.1631</td>
</tr>
<tr>
<td>BS</td>
<td>0.057950</td>
<td>0.028339</td>
<td>2.044898</td>
<td>0.0473*</td>
</tr>
<tr>
<td>INF</td>
<td>-0.002487</td>
<td>0.005611</td>
<td>-0.443180</td>
<td>0.6600</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.531453</td>
<td>0.575378</td>
<td>-0.923659</td>
<td>0.3611</td>
</tr>
<tr>
<td>R2</td>
<td>0.885643</td>
<td>0.863329</td>
<td>39.69073</td>
<td>0.000000</td>
</tr>
<tr>
<td>Adj. R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob(F-Statistic)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* , ** and *** indicate significance levels at 1%, 5% and 10% respectively. Source: SCG, EBG, GCB and CBG and SGB (2006 – 2015)
Tables 2 and 3 above presents the fixed effects model results. The results are on 40 balanced observations pooled from the four major banks for the years 2006 to 2015 with ROE as the dependent variables respectively. The results are in conformity with the prepositions for all the research variables. The p-values for almost all research variables are less than 0.05 which indicates a significant relationship between the dependent variables and the independent variables. The annual inflation is however insignificant since the p-value is greater than 0.05, which is consistent with Chin’ Anga (2015) and Wangai, Bosire and Gathogo (2014).

After the pooled regression model and the fixed effects model estimations to ascertain the relationship between the independent variables and the dependent variables it then becomes essential to select the best model and give a more detailed summary of the results of the best model.

In order to choose the most appropriate model a fixed effect redundant test was employed to estimate whether the cross-section units are the same. The null hypothesis is that the fixed effect redundant test being used for the model is 89% which suggests that the independent variables and to be robust in order to control the presence of heteroskedasticity and autocorrelations in the variables. The results in table 2 also show R² to be 89% suggesting that the independent variables in the model explained 89% of the variations on profitability performance measured by ROE.

In reference to the effect of each independent variable, the result in table 2 indicates that NPLR and BS negatively and positively affect ROE at 0.01 and 0.05 significant levels respectively. This means that a unit increase in BS will result in approximately 6% increase in ROE. The results general show ROE of commercial banks in Ghana is highly sensitive to ratio of nonperforming loan to total loan and advances (NPLR), CAR and BS. However, the effect CAR has on ROE is not statistically significant.

The Adjusted R-squared value of 0.863329 implies that about 86% of the variations in the ROA and ROE are explained by variations in the independent variables used for this study. This means that other variables can explain 14% of variations of ROE. Further, the F-statistics values of 41.47419* for ROE indicates that the independent variables used for this study jointly and significantly affect profitability.

e) Discussion of results

Tables 2 and 3 show the results of the study using the fixed effect redundant test model. Balanced panel data is used for 2006 to 2015 with a total of 40 observations from four sampled banks with ROE as the dependent variables. NPLR and CAR are the study’s main independent variables which represent nonperforming loans of profitability. The results for the first proposition (P1) on CAR; CAR has a positive effect on profitability are confirmed in the ROE model. That means that a unit increase in CAR will result in an equal increase in the banks’ profit and are consistent with Molyneux and Thornton (1992), Berger et al. (1995), Naceur (2003), Goddard et al. (2004) Brewer and Jackson (2006), Havrylchyk et al. (2006), Athanasoglw et al. (2008), Ara et al. (2009), Ramlial (2009) and Oladele et al. (2012).

Consistent with the findings of Buyuksalvarci and Abdiogiu (2011) and Qin and Dickson (2012), this study shows that CAR has a significant negative effect on ROE. In this regard, Ezike and Oke (2013) stated that holding capital beyond the optimal level would inversely affect the efficiency and profitability of banks. Though the minimum CAR requirement of Commercial banks in Ghana is 10%, (Banking Act, 2004, Act 673), the descriptive statistics indicated average CAR of the banks under study was 16%, higher than the minimum requirement. Taking the argument of Ezike and Oke

### Table 3: Correlated Random fixed effects- Hausman test

<table>
<thead>
<tr>
<th>Effects test</th>
<th>Statistic</th>
<th>Chi-Sq. d.f</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Chi-square</td>
<td>13.013826</td>
<td>4</td>
<td>0.0112</td>
</tr>
</tbody>
</table>

Global Journal of Management and Business Research       Volume XVIII Issue II Version I 2018

86.33% of the variations in ROE can be explained by the CAR. Interpretations from the table 2 illustrate here.

The empirical results of bank size (BS) were in line with the third proposition (P3). BS has a positive relationship with profitability explained by ROE which is inconsistent with similar studies by Godlewski, Molyneux and Naceur (2003) and Javaid et al. (2011) who found bank size to impact on bank profits negatively. Bank size prove to have a positive effect on profitability in Ghanaian banks as shown by the positive coefficient.

Even though the proposed effect on profitability (P4), the effect of inflation on profitability is confirmed, it is insignificant since its p-values is 0.6600, far above the bench mark probability value of 0.05. This is consistent with studies by Revel (1979) and Perry (1992) who found that inflation could have either a positive or negative effect on profitability. The model as a whole indicates a high prediction of the percentage of variation in ROE explained by all independent variables as revealed by the adjusted R². Adjusted R² shows that 86.33% of the variations in ROE can be explained by the explanatory variables.

The interestingly from the descriptive statistics and the observation of the trend on NPL in Ghanaian banks as per the study of Getahum (2012) and Metaahun (2012) showed some decline which indicates that managers and policy makers in Ghana have strengthen their credit management strategies in the banking industry.

IV. Conclusion

The paper was set out to identify the prevailing relationship between non-performing loans and profitability performance of commercial banks in Ghana. Previous studies in Ghana are few and studies in general were inconclusive. Motivated to fill this gap a descriptive statistics and panel data regression analysis were employed on secondary data collected from five commercial banks listed on the Ghana Stock Exchange for a period of 10 years (2006 - 2015).

The study found the fixed effects model to be the most appropriate method to analyse the data. A detailed analysis of the results from the fixed effects model is presented. The study finds that non-performing loans has an effect on profitability in Ghanaian banks as expected, with CAR having a positive significant effect and NPLR having a negative significant effect on profitability at the 1% level of significance in line with the study by Ara et al (2009). This suggests that credit risk management could be used to enhance profitability in banks by increasing capital adequacy requirements.

The result revealed that nonperforming loans (credit risk) profile of Ghanaian banks had been improving during the study period. The ratio of nonperforming loan (credit risk) is gradually declining in past years. The CAR of commercial banks was found to be higher than the regulatory requirement (Banking Act, 2004, Act 673) at local and international level, but the descriptive analysis proved commercial banks in Ghana have adequate capital to absorb shocks resulting from non-performing loans and other operational risks. The study found that non-performing loans and capital adequacy have a negative and positive significant impact respectively on profitability of commercial banks in Ghana.

Having underscore a significant overall effect of the effect of non-performing loans on the profitability of commercial banks in Ghana, it is suggested that a rigorous credit risk management process is of paramount importance to the banks. Hence managers are advised to employ a modern credit risk management technique and diversify the earning activity of their respective banks. Banks should also be cautious on the rate they expand since bank size can equally affect their fortunes. Government, in collaboration with the central bank has to control the macro-economic variables such as inflation and exchange rate (cedi depreciation) since they also impact on profitability of banks.

References Références Referencias


8. Eston Eston Chimkono, Willy Muturi and Agnes Njeru (2016), Effect Of Non-Performing Loans And Other Factors On Performance Of Commercial Banks in Malawi


