Credit Risk and Bank Profitability: Evidence from Ghana Stock Exchange

Richard Takyi Opoku; Peter Lawer Angmor; Lawrence Asare Boadi
Department of Banking and Finance; Faculty of Accounting and Finance University of Professional Studies, Accra, Ghana
o.takyi@yahoo.com
Department of Accounting and Finance; Faculty of IT Business Ghana Technology University College, Accra, Ghana
aplawer@yahoo.com
Department of Finance and Accounting ASN Investment Ltd, Accra, Ghana
Correspondence: aplawer@yahoo.com

Abstract
This study analyzed the relationship between credit risk and profitability of banks on the Ghana Stock Exchange. A secondary data in a panel form of seven banks listed on the Ghana Stock Exchange was examined over a period of nine years, using a linear multiple regression model. One key measure of profitability was analyzed in this study that is return on equity. The independent variables included in the regression model were non-performing loan to total loan and advances, and loans and advances to total deposits, bank size, leverage and growth. The results for the study indicate that non-performing loan to total loans and advances and loans and advances to total deposits have significant negative relationship with return on equity. Furthermore, a negative insignificant relationship was established between size and return on equity but significant positive relationships were found between growth and leverage and profitability.

It was recommended that Credit officers should ensure that customers looking for loans meet all the necessary requirements through proper due diligence.

Key words: Credit risk, Profitability, Ghana Stock Exchange, panel data, regression

1.0 Introduction
Banks are relevant to economic development through the financial services they provide. Their intermediation role can be said to be a catalyst for economic growth. The efficient and effective performance of the banking industry over time is an index of financial stability in any nation. It is believe that the extent to which a bank extends credit to the public for productive activities accelerates the pace of a nation’s economic growth and its long-term sustainability (Funso et al 2012).

Credit creation is the main income generating activity for banks, but this activity involves huge risks to lenders. A bank with high credit risk has high bankruptcy rate and that puts depositors in a dangerous state and may even lead to bad reputation, withdrawal of license or even the collapse of the bank. However, in a bid to survive and maintain adequate profit level in this highly competitive environment, banks tend to take excessive risks, yet, the increasing tendency for high risk taking has resulted in insolvency and failure of a large number of banks all over the world.
The banking industry in Ghana is no exception to the issue of loan defaults. Indeed, a Bank of Ghana study in 2011 clearly established that non-performing loans ratio which directly affects credit risk increased from 16.2 percent in 2009 to 17.6 percent in 2010. In spite of that, profitability in the banking industry still went up over the same period. On the basis of such revelation by the central bank’s study, the question that arises is does credit risk affect the profitability of banks in the country?

The banking industry in Ghana has experienced massive growth in the last decade and that has also increased the level of credit risk in the sector. Banks in the country are spending a lot of money in managing credit risk. However, the effect that credit risk is having on the profitability of banks has not been fully explored, hence the present study.

Although many studies have been done on credit risk and profitability outside Ghana, for instance (Franklin, 2012, Funso et al, 2012 and Epure and Lafuente, 2012), not many studies has been done in Ghana. Moreover, the few existing studies on Ghana relied on data that was in existence before the implementation of the Basel II. For instance Amidu and Hinson (2006), used data from 1998-2003 whiles Boahene et al (2012) used data from 2005-2009. However, a lot of changes have occurred in the Ghanaian economy since then, issues such as the commercial production of oil and the rebasing of the economy have affected the banking sector. This study therefore has the main objective to investigate the influence of credit risk on bank profitability using data from 2007 to 2014 and focusing on banks listed on the Ghana Stock Exchange.

As the concept of credit risk management is gaining roots among the stakeholders of Ghanaian banks, it is hoped that the findings of this study will be useful to regulators and management of banks as it provides evidence on the relationship between credit risk and banks’ profitability. This will help them to come out with relevant policies to protect banks and their customers in the industry. It will also help understand why good credit risk management is vital to the sustainability of banks, especially emerging banks that want to be listed on the Ghana Stock Exchange (GSE).

2.0 Literature Review

Epure and Lafuente (2012) examined banks’ performance in the presence of risk for Costa-Rican banking industry during 1998-2007. The results showed that performance improvements follow regulatory changes, risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the net interest margin.

Also, Benedikt et al (2007) examined credit risk management policies for ten banks in the United States using a multivariate model and found that banks that adopt advanced credit risk management techniques (proxies by the issuance of at least one collateralized loan obligation) experience a permanent increase in their target loan level of around 50%. Partial adjustment to this target, however, means that the impact on actual loan levels is spread over several years. The findings confirm the general efficiency-enhancing implications of new risk management techniques in a world with frictions suggested in the theoretical literature.

An earlier study conducted by Macaulay (1988) in the United States found that credit risk management is the best practice in the bank and above 90% of the banks in the
country have adopted the best practice. Inadequate credit policies are still the main source of serious problem in the banking industry and as result; effective credit risk management has gained an increased focus in recent years. The main role of an effective credit risk management policy must be to maximize a bank’s risk adjusted rate of return by maintaining credit exposure within acceptable limits. Moreover, banks need to manage credit risk in the entire portfolio as well as the risk in individual credits transactions.

It is believed that private Banks are more serious to implement effective credit risk management practice than state owned banks. A study conducted by Kuo and Enders (2004) of credit risk management policies for state banks in China and found mushrooming of the financial market; the state owned commercial banks in China are faced with the unprecedented challenges and tough for them to compete with foreign bank unless they make some thoughtful change. In this thoughtful change, the reform of credit risk management is a major step that determines whether the state owned commercial banks in China would survive the challenges or not.

In another study, Kargi (2011) evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of banks’ performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks’ profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

In a related study, Kithinji (2010) assessed the effect of credit risk management on the profitability of commercial banks in Kenya. Data on the amount of credit, level of non-performing loans and profits were collected for the period 2004 to 2008. The findings revealed that the bulk of the profits of commercial banks are not influenced by the amount of credit and non-performing loans, therefore suggesting that, variables other than credit and non-performing loans impact on profits.

In Ghana, Amidu and Hinson (2006) examined how credit risk affects a bank’s capital structure, profitability and lending decisions of banks in Ghana. The study employed panel regression analysis to investigate the relationship between credit risk exposure and bank capital structure, profitability and lending decisions. The results indicate that less than 1% of Ghanaian banks are exposed to credit risk, and that more than 86% of their assets are financed by debts. The banks’ average lending rate is around 28%. The results also showed that capital structure (equity to total assets) of banks is positively related to banks’ credit risk, profitability and risk and negatively related to banks’ size, liquid assets and lending.

Similarly, Boahene et al (2012) conducted a study on credit risk and profitability of selected banks in Ghana and concluded that, credit risk (non-performing loan rate, net charge-off rate, and the pre-provision profit as a percentage of net total loans and advances) has a positive and significant relationship with bank Profitability. However, it must be indicated that data for the above studies were there before the implementation of the Basel II in the country. Moreover, a lot of changes have occurred in the Ghanaian economy since 2010. The present study is therefore necessary to assess
the current situation in order to make the necessary recommendations.

3.0 Materials and Methods
The main purpose of the study is to examine the effect of credit risk on profitability of banks listed on the GSE. The study therefore adopts the descriptive design in its analysis. The study also follows quantitative approach involving a multiple regression in a panel form. This enabled the study to examine the relationship between credit risk management and listed banks profitability. All banks listed on the GSE were included. The study made use of purely secondary data. The annual financial reports of the banks were obtained with the aid of data from the Ghana Stock Exchange Fact Books and the banks’ annual reports. The data collected span the period of seven years (2007 – 2014).

3.1 Statistical Analysis and Model Specification
This is a quantitative study which employs a panel regression method in its analysis. To summarize variables involved in the statistics, the study employed STATA statistical software (version 12) for its analysis. The data was analyzed by calculating the profitability for each year over the period of the study. Ratios for the other variables were also calculated for the same period.

Banks profitability is the dependent variable represented by return on equity (ROE). Two variables were used to represent credit risk, which are the ratio of non-performing loans to total loans and advances and the ratio of total loans and advances to total deposit. The study also used bank size, leverage and growth as control variables. The study therefore specifies the model below

\[ \text{ROE}_{it} = \beta_0 + \beta_1 \text{NPLR}_{it} + \beta_2 \text{LATD}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{LEV}_{it} + \beta_5 \text{GRO}_{it} + \epsilon_{it} \ldots \ldots (1) \]

Where:
ROE is measured as net income to total asset of bank \(i\) in time \(t\)
NPLR is measured as non-performing loans/total loans and advances of bank \(i\) in time \((t)\)
LATD is measured as loan & advances/total deposit for bank \(i\) in time \((t)\)
SIZE is measured as natural logarithm of total asset of bank \(i\) in time \((t)\)
LEV is measured as total debt to total assets of bank \(i\) in time \((t)\)
GRO is measured as growth in bank interest income, year on year basis \((+\))
\(\epsilon\) is the error term

4.0 Results and Discussion
4.1 Summary Statistics of Variables Included in the Study
Table 1 displays the results of the descriptive statistics. The results showed that return on equity has a mean of 24% with a minimum of 2.9% and a maximum of 56%. It suggests that on the average, banks make a return of 24% on their equity but this can increase to as high as 56% and as low as 2.4% which is a good return. Observing from the results revealed that, banks on the GSE are performing relatively well in terms of profitability and with a very low disparity suggesting that it is less risky to invest in them.

The result also reveals that loan and advances ratio has a mean of 0.868 with minimum and maximum figures as 0.141 and 2.309 respectively. This suggests that on the average about 86% of deposits made by customers are giving out as loans. But whiles some banks gave as low as 14% of deposits as loans others gave as high as 231% which is quit scary. Additionally, non-performing loans ratio has a mean of 0.020. This suggests that as far as listed banks are concerned, on
the average 2% of the loans given out becomes bad. The results showed that the average debt ratio of banks listed on GSE is 0.854. This suggests that on the average 85% of the assets of banks on GSE is financed by debt. However, some firms have as low as 10% debt whiles others have as high as 92% of their capital finance by debt. This is understandable as the main source of finance for banks are customer deposits. Furthermore, size of banks listed on the Ghana Stock Exchange appears to have wide disparity with standard deviation of 3.5 and minimum and maximum figures giving as 8.9 and 19.9 respectively. It means that some banks are more than twice bigger than others in terms of total asset. The result also reveals that the average growth rate within the industry is 0.311. This means that during the period of the study, firms within the banking sector were growing in terms of sales of about 31%. However, whiles some banks recorded a maximum figure of as high as 115%, others recorded a minimum figure of as low as -92%. This therefore produces a very high disparity from the mean. The standard deviation from the mean is 37% which is understandable looking at the minimum and maximum figures.

Table 1: Results of Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>49</td>
<td>0.242</td>
<td>0.122</td>
<td>0.029</td>
<td>0.561</td>
</tr>
<tr>
<td>NPLR</td>
<td>49</td>
<td>0.020</td>
<td>0.024</td>
<td>0.001</td>
<td>0.133</td>
</tr>
<tr>
<td>LATD</td>
<td>49</td>
<td>0.868</td>
<td>0.335</td>
<td>0.141</td>
<td>2.309</td>
</tr>
<tr>
<td>SIZE</td>
<td>49</td>
<td>14.644</td>
<td>3.529</td>
<td>8.982</td>
<td>19.918</td>
</tr>
<tr>
<td>LEV</td>
<td>49</td>
<td>0.854</td>
<td>0.115</td>
<td>0.105</td>
<td>0.928</td>
</tr>
<tr>
<td>GRO</td>
<td>49</td>
<td>0.311</td>
<td>0.379</td>
<td>-0.928</td>
<td>1.159</td>
</tr>
</tbody>
</table>

Source: Authors’ construct

Table 2: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>ROE</th>
<th>NPLR</th>
<th>LATD</th>
<th>SIZE</th>
<th>LEV</th>
<th>GRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPLR</td>
<td>0.214</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LATD</td>
<td>-0.446**</td>
<td>-0.396**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.258</td>
<td>-0.298*</td>
<td>0.078</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>0.279</td>
<td>-0.127</td>
<td>-0.039</td>
<td>0.012</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>GRO</td>
<td>0.169</td>
<td>-0.002</td>
<td>0.263</td>
<td>-0.199</td>
<td>-0.084</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Source: Authors’ computations

Note: the asterisk *, **, indicate significance at 5% and 1% levels respectively

Table 2 contain results of the correlations among the variables included in the study. It can be observed from table 2 that there is no high correlation of the two credit risk indicators used. The other independent variables are also not highly correlated with
the credit risk indicators making their use very appropriate.

The issue of no multicollinearity was confirmed by the variance inflation factor (VIF) analysis which has been displayed in table 3 below. The rule of thumb is that a variable with VIF of more than 10 is highly collinear with another independent variable. It can be observed from the table that all the independent variables have VIF figures below 10.

### Table 3: Results of Variance Inflation Factor

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRO</td>
<td>1.14</td>
<td>0.877</td>
</tr>
<tr>
<td>SIZE</td>
<td>1.17</td>
<td>0.856</td>
</tr>
<tr>
<td>LEV</td>
<td>1.03</td>
<td>0.970</td>
</tr>
<tr>
<td>LATD</td>
<td>1.26</td>
<td>0.792</td>
</tr>
<tr>
<td>NPLR</td>
<td>1.32</td>
<td>0.760</td>
</tr>
<tr>
<td>MAEN VIF</td>
<td>1.18</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Authors’ construct*

### 4.2 Discussion of Regression Results

From the results in Table 4 below, the R-squared and Adjusted R-squared figures of 0.395 and 0.325 respectively are satisfactory though not that high. This means that about 39% of the variations in the dependent variable that is return on equity are explained by the independent variables. The F-statistics has a value of 5.62 and is highly significant at 1% significance level. From the results, non-performing loans ratio is negatively related with profitability of banks. It has a coefficient of -0.026 and t-statistics of -0.04. It means that the profitability of banks in terms of ROE reduces by 2.6% when non-performing loan ratio increases by 1%. This is contrary to the findings of Boahene et al (2012) who documented a positive relationship between credit risk and profitability. This may be due to changes in the Ghanaian economy which have affected the situation now. The relationship is significant at 5% critical level. The findings therefore support the work of Kargi (2011) who concluded that banks’ profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

In line with expectation, the results also show a significant negative relationship between loans and advances ratio and profitability of banks listed on GSE over the period of the study. Loans and advances ratio has a coefficient of -0.181 with a t-statistics of -3.69 meaning that an increase in loan and advances ratio leads to a decline in profitability of banks. The relation is significant at 5% with a p-value of 0.001. This is also consistent with the documentation of Kargi (2011) that the level of loans and advances negatively affect bank profitability. Moreover, from the results in Table 4, SIZE had negative relationship with ROE. It means that increasing bank size leads to decreasing profitability of banks listed on the GSE. This is contrary to expectation but could be explain that, too much expansion bring about inefficiencies due to management
control problems. However, the relationship is not significant at 5% critical level making bank size not important in determining profitability. Leverage (LEV) on the other hand is significantly related to ROE. At 5% confidence level leverage is positively significant with return on equity. It has a coefficient of 0.308 and a t-statistics of 2.41 which is very significant based on p-value of 0.021. What it means is that, as debt ratio of banks increase, their profitability also increase. This is therefore in line with expectation of the study. It suggests that leverage is important in influencing the profitability of banks listed on GSE. Additionally, growth had positive relationship with return on equity. At 5% confidence level, growth is significantly positively related to return on equity. This means that as banks grow in sales, their performance in terms of profitability increases, and a result which conforms to accounting theory.

Table 4: Regression Results of (ROE) Function

<table>
<thead>
<tr>
<th>Regression</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Statistics</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONS</td>
<td>0.189</td>
<td>0.146</td>
<td>1.29</td>
<td>0.203</td>
</tr>
<tr>
<td>NPLR</td>
<td>-0.026</td>
<td>0.687</td>
<td>-0.04</td>
<td>0.040*</td>
</tr>
<tr>
<td>LATD</td>
<td>-0.181</td>
<td>0.049</td>
<td>-3.69</td>
<td>0.001**</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.006</td>
<td>0.004</td>
<td>-1.28</td>
<td>0.207</td>
</tr>
<tr>
<td>LEV</td>
<td>0.308</td>
<td>0.128</td>
<td>2.41</td>
<td>0.021*</td>
</tr>
<tr>
<td>GRO</td>
<td>0.094</td>
<td>0.040</td>
<td>2.30</td>
<td>0.027*</td>
</tr>
<tr>
<td>R²</td>
<td>0.395</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.325</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Stats</td>
<td>5.62</td>
<td></td>
<td></td>
<td>0.000**</td>
</tr>
</tbody>
</table>

Source: Authors’ computations
Note: the asterisk *, ** indicate significance at 5% and 1% levels respectively.

5.0 Conclusion

The banking industry in Ghana has experienced massive growth in the last decade and that has also increased the level of credit risk in the sector. The study sought to find out the effect of credit risk on performance of banks listed on the Ghana Stock Exchange. The regression results revealed that credit risk (non-performing loans ratio and loans and advances ratio) has significant negative effect on profitability (ROE) of banks listed on GSE. The study on the bases of the findings concludes that credit risk management is an important determinant of profitability of banks listed on GSE providing support for many empirical findings.

However, the findings contradict the study of Boahene et al (2012). This is due to changes in the Ghanaian economy which have affected the data. Furthermore, a negative insignificant relationship was established between size and ROE. However, the study revealed significant positive relationships between growth and leverage and profitability. In view of the above findings, the study recommends that Ghanaian banks should adopt sophisticated mitigating techniques of credit risk management that includes hedging credit risk: having adequate provisions for doubtful credits: renegotiating
loan terms for insolvent customers, transferring credit to the third party, rescheduling customer credit, extending credit maturity. A comprehensive credit risk policy involving the issues listed above will go a long way to improve efficiency in credit risk management. Management of banks should also put in place appropriate measures to reduce the percentage of non-performing loans in their books. This will help reduce their losses and increase their profitability. They can achieve this by making sure that loans are giving to only credit worthy customers. Credit officers must ensure that customers looking for loans meet all the necessary requirements through proper due diligent. Any credit officer who fails to do proper due diligent leading to loan default should be made to pay.

References


