

# The Impact of Credit Risk on the Performance of Banks in Ghana

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*Received: 6 June 2021 Accepted: 1 July 2021 Published: 15 July 2021*

## Abstract

This paper examined the impact of credit risk on the performance of banks in Ghana using unbalanced panel data of 16 banks over the period 1990 to 2018. OLS method of estimation was adopted on a multiple regression equation. The study employed a causal design. The results indicate a significant positive relationship between net interest income and return on assets. Even though there is a negative relationship between return on assets and loan loss provision on one hand and Interest Rate Spread on the other they are insignificant. Again, the relationship between loan loss provision and operating expense/income ratio is negative and significant. However, there is no significant relationship between operating expense/income ratio and net interest income on one hand and interest rate spread on the other. Banks should therefore improve on their interest income generation and minimize their loan loss provisions for good performance.

**Index terms**— credit risk, bank performance, return on assets, interest rate spread, ghana.

## 1 Introduction and Background

The uncertainty of the banking industry has been confirmed in the words of Santomero (1996), who says, over the years the banking industry has experienced severe losses. Banks that had been performing well suddenly announced large losses due to credit exposures that turned sour, interest rate positions taken, or derivative exposures that may or may not have been assumed to hedge balance sheet risk.

Over the years, bank failures and insolvencies have emerged all over the globe, both in developed and developing countries. Not only have the crises been widespread, but their cost have equally been extremely high, thereby creating an urgent need to encourage governments and bank regulators to establish and strictly enforce oversight measures and not delay in addressing banking sector weaknesses (Thomas, 2001). There has been intensive research by financial institutions, regulators and academics to develop sophisticated models for better market risk estimation. As indicated by Raghavan (2003), risk management underscores the fact that the survival of an organization depends heavily on its capabilities to anticipate and prepare for the change and react to it.

Ghana is no exception to the challenges of the industry as seven banks collapsed within two years between 2017 and 2018. Even though many reasons were assigned to the collapse of these banks, the two most important ones are about credit risk management and corporate governance. This study investigates an aspect of credit risk management. In this research, credit has been identified as a very important source of risk for banks and other financial institutions and therefore requires special investigation. This paper seeks to determine the impact of credit risk on bank performance using data on universal banks in Ghana from the year 1990 to 2018 that is a period of 29 years. The research used secondary data of sixteen universal banks in Ghana. These include the following banks: Agricultural Development Bank, Amalbank (now Bank of Africa), CAL Bank, Fidelity Bank, GCB Bank, Merchant Bank (now Universal Merchant Bank), Prudential Bank, SSB Bank (now SG-SSB Bank), Others are, Access Bank, Barclays Bank, Ecobank, Guaranty Trust, Stanbic, Standard Chartered Bank, United Bank of Africa and Zenith Bank.

Across the globe, the banking sector acts as the source of economic development and growth for any country through their mediation role and services of financial nature. In Ghana the banking sector is assuming an important role and regarded as a key player in the socio-economic progress of the country. A banking system mobilizes savings in productive sectors and in turn meets its obligation towards the community by providing credit to the business sector. Just like any profit-making venture, the main objective of the bank is to maximize the wealth of its shareholders. This objective can only be achieved when the bank seeks to enhance its profitability by performing the lending function along with other functions efficiently. Credit risk is defined as the risk that the promised cash flows from loans and securities held by financial institutions may not be paid in full. It is also the probability that some of a bank's assets, especially its loans will decline in value and possibly become worthless compared to its liabilities.

The worldwide credit crunch which started in 2006 in the United States with sub-prime mortgages is a typical example of how far banking crises can impact economies globally and serves as a wake-up call to bank managers to ensure efficiency in the area of credit risk management (Garr, 2016). It has highlighted the fundamental importance of the credit decision. As the problems in these mortgages unfolded, it was demonstrated that unsound credit decisions had been made and lessons as to how to manage credit risk effectively had been either ignored or never learned. This shows that poor lending decisions, whether by a financial institution or a corporate, can lead to significant losses. What the incredible losses sustained by banks and others caught up in the credit crunch have underlined is the major impact of credit risk on the wellbeing and profitability of businesses. Being able to manage this risk is a key requirement for any lending decision. This is well understood by banks and other lending institutions that make their profit by advancing money to individual and corporate borrowers (Brown and Moles, 2014).II.

## 2 Theoretical Review a) Economic Theory

This research is based on the theories of financial intermediation, Keynesian theory of money demand and monetary policy, theories of the term structure of interest rate (the yield curve), loanable fund theory, portfolio theory, and agency theory. Researchers such as Schumpeter (1934), Goldsmith (1969), Khatkhate (1972), McKinnon (1973), Shaw (1973), Diamond (1984) and Creane, Rishi, Mobarak, and Sab (2004) have hypothesised that financial intermediation reduces transaction costs, asymmetric information and monitoring costs and this indirectly stimulates growth. Among the early studies, Goldsmith (1969) finds evidence of a relationship between economic and financial development over long periods Keynesians believe that the interest rate, for example which is closely related to credit risk management is a monetary phenomenon, and largely determined by the supply of and demand for money. Monetarists on the other hand, believe that the interest rate, is a real phenomenon, and largely determined by the supply of and demand for loanable funds; a market which reflects actual opportunities and constraints in the investment sector. The quantity theory of money holds that when the money supply changes by a certain percentage, the price level changes by the same percentage. Loanable funds theory assumes that interest rates are determined by supply of loanable funds and demand for credit (Fry, 1995).

## 3 b) Credit Risk

Banks are established not only to accept deposits but also to grant credit facilities, and are therefore inevitably exposed to credit risk. Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks (Giesecke, 2004).

Credit risk according to Garside, Stott and Stevens (1999) is conventionally defined using the concepts of expected loss and unexpected loss. Because expected losses can be anticipated, they should be regarded as a cost of doing business and not as a financial risk. Credit risk modelling was pioneered by Merton (1974), who proposes that a firm is expected to default when the value of its assets falls below a threshold value determined by its callable liabilities. While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to among others a lack of attention to changes in economic or other circumstances that can lead to deterioration in the credit standing of a bank's counterparties (Consultative paper issued by the Basel Committee on Banking Supervision, July 1999).

## 4 c) Bank Performance

Using bank profitability to represent bank performance, Greuning and Bratanovic (2000) observe that profitability is a revealing indicator of a bank's competitive position in banking markets and of the quality of its management. It allows a bank to maintain a certain risk profile and provides a cushion against shortterm problems. Said and Tumin (2011) propose a theoretical link between credit risk and bank performance and this theory suggests that increased exposure to credit risk is normally associated with decreased firm profitability. Hence, a negative relationship is expected between return on assets and return on equity on one hand and credit risk on the other hand. Banks would, therefore, improve profitability by improving screening and monitoring of credit risk.

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## 5 d) Interest Rate Spread

Related closely to credit risk is the interest rate spread. Interest rate spread is defined as the difference between deposit rate and the lending rate. Interest rate spread is a measure of profitability between the cost of short term borrowing and the return on long term lending. The spread according to Rose and Hudgins (2008) (Ngugi, 2001). Folawewo and Tennant (2008) define the interest rate spread as the difference between the average lending rate and the average deposit rate. Following the works of Folawewo and Tennant (2008), the difference between average lending rate and average borrowing rate is adopted in this research to define the interest rate spread.

Developing countries are noted for their large interest rate spreads and high loan losses, and this sparks numerous debates about the impact of banking sector interest rate spread and loan losses on bank profitability and efficiency. These debates can only be resolved through objective analysis of the impact of credit risk and banking sector interest rate spreads on bank performance.

## 6 e) Operating Costs

Operating costs are explained by the cost of financial intermediation, market segmentation theory, loanable funds theory as well as Keynesian theory of money demand. Applying the financial intermediation theory and the loanable funds theory would explain how increase in operating costs leads to increase in intermediation cost resulting in high interest rate spread as a result of high cost that is experienced by lending financial institutions in their daily operations.

## 7 III.

## 8 Empirical Literature

Sound and effective banking system is required for a healthy economy to meet new challenges imposed by technological advancement and competition. Researchers such as Pyle (1997), Safakli (2007), Saunder and Cornett (2008) have indicated that the main type of risk in banks is credit risk since by far the largest bank asset item is loans. The main objective of a bank just like any profit-making organisation is to maximise its shareholder value. All activities of banks concerning management of credit and its associated risk and interest rate spread determination are geared towards maximising profit. According to Greuning and Bratanovic (2000), profitability in the form of retained earnings, is typically one of the key sources of capital generation. Also, as observed by Frankel (2001), banks exist to make risky investments, and expecting them to have no bad loans is unrealistic. In an efficient, wellfunctioning financial system, banks should even fail occasionally. However, Moskow (2001) does not believe that banking crises are inevitable. To him, the more time spent on prevention, the less the need for crisis resolution. Also, in the opinion of Leipziger (2001), the problem is how to judge portfolio quality in a more dynamic sense, as portfolios that appear perfectly healthy one day can look quite unhealthy the next day depending on the external circumstances.

The higher the exposure of a bank to credit risk, the higher is the tendency of the bank to experience the financial crisis and vice-versa. The literature reviewed and the arguments by scholars show that the poor performance of banks and series of financial crisis over the years is the result of high credit risk and inadequate credit risk management.

Unfortunately, research on the relationship between credit risk and bank performance in developing economies especially Sub-Saharan Africa is limited. Few studies on the subject are by Das and Ghosh (2007), and Al-Smadi (2010) all on banks outside sub-Saharan Africa. Amidu and Hinson (2006) however researched on how credit risk affects a bank's capital structure, profitability and lending decisions using all banks (nineteen) in Ghana. Luqman (2014) in investigating the effect of credit risk on the performance of Nigerian commercial banks concludes that credit risk measured by the ratio of loans and advances to total deposits and the ratio of Non performing loans as a ratio of loans and advances is negatively related to bank profitability. Das and Ghosh (2007) and Al-Smadi (2010) defined and measured credit risk by using loan loss as a ratio of bank assets and failed to include net interest income, downplaying the importance of income in credit risk analysis. This current study filled the gap by expanding the definition of credit risk to cover loan loss provision, net interest income, and interest rate spread using data on sixteen banks in Ghana. An efficient credit risk management is expected to enhance the performance of a bank.

There are a number of studies that confirm the importance of credit risk management in banks. Studies carried out by Kargi (2011) and Kolapo, Ayeni and Oke (2012), for instance, to assess the impact of credit risk on the performance of Nigerian banks conclude that credit risk management has a significant impact on the profitability of Nigerian banks. Flamini, McDonald and Schumacher (2009) and Dietrich and Wanzenried (2009) propose that bank profitability should reflect bankspecific, as well as risks associated with the macroeconomic environment (non-diversifiable, systemic risk). They indicate that bank profitability is usually measured by the return on average assets and in supporting Bourke (1989) propose that it is expressed as a function of internal and external determinants.

Obideke, Ejeh and Ugwuegbu (2015) used bank assets as a proxy for bank performance, but in this research two variables are used to represent bank performance. These are, operating expenses as a ratio of total operating

income (EXP/INC) and profit before tax as a ratio of total assets (PBT/ASSETS) of banks. Otherwise known as Return on Assets (ROA).

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### 10 Research Methodology a) Model Specification

For the purpose of this work, following the work of Obideke, Ejeh and Ugwuegbe (2015) OLS method of estimation is adopted on a multiple regression equation to analyze the effect of credit risk on the performance of The study employs a causal design since it allows the measurement of the relationship or impact of an independent variable on the dependent variable. In this research, following the approach of Garr (2013), credit risk (CR) as measured by two ratios loan loss provision as a ratio of bank assets (Angbazo, 1997; Demirguc-Kunt & Huizinga, 1998) and net interest income also as a ratio of bank assets (Kalluci, 2011) Interest rate spread (IRS) is defined as the difference between average lending rate of banks and average borrowing rate of banks. The loan loss provision in this research is a bank's balance sheet account which reflects the bank's estimate of potentially bad loans. Provisions are made to compensate for the impaired value of the related loan principal and interest due. The figure represents what the bank thinks is sufficient to cover losses on its outstanding loans. The net interest income is the difference between interest earned on interest-earning assets and interest paid on deposit liabilities. It measures the efficiency of the bank intermediation process.

The justification for combining credit risk and interest rate spread in determining the impact of credit risk on bank performance is that interest rate spread is one of the strategies banks adopt in managing credit risk. When credit risk is high, a wider interest rate spread is expected to be used to mitigate its effects. And an efficient management of credit risk and interest rate spread is expected to result in higher bank performance (Garr, 2016). About seventy percent of bank business in Ghana is made up of credit. Therefore credit risk is the most dominant risk faced by banks in Ghana. It can therefore be concluded that a profitable bank is the one with a well-managed credit risk.

The research covered sixteen of the banks which are currently either operating in Ghana or defunct. The research covered the period 1990 to 2018. Unbalanced panel data was used because not all the banks were in existence throughout the twenty nine year period. Some of the banks were less than 15 years old in Ghana at the time of this research.

In this research, bank performance as a dependent variable is measured using return on assets which is defined as the ratio of profit before tax to total bank assets. Second, it is defined by using the transaction cost, which is measured by the total operating expense as a ratio of total operating income (OE/OI).

$$ROA = f(LLP/BankAssets + NII/BankAssets + IRS)?$$
$$1\ OE/OI = f(LLP/BankAssets + NII/BankAssets + IRS)?$$

### 11 IRS = Interest Rate Spread

The model is specified as follows:  $BP = \beta_0 + \beta_1 LLP/BA + \beta_2 NII/BA + \beta_3 IRS + U_t$  Where BP is bank performance, LLP/BA is the ratio of Loan Loss Provision to Bank Assets, NII/BA represents the ratio of net interest income to Bank Assets and IRS represents Interest Rate Spread.

V.

## 12 Data Presentation and Analysis of Findings a) Descriptive statistics

The summary of the descriptive statistics of the dependent and independent variables are presented in table 1 below. The variables are grouped under bank performance measures: return on assets (ROA), and operating expense (OE) as a ratio of net operating income. The descriptive statistics of the data are presented in five columns containing the variable, ROA, OE/OI, LLP/BA, NII/BA, and IRS. As can be seen all the variables exhibit a positive mean and IRS is negatively skewed.

In the table, return on assets obtained a mean of 0.05% with maximum of 0.096% and minimum of 0.02% respectively. The mean operating expense is 0.56%, with a maximum of 1.08% and minimum of 0.28%. Operating expense (OE) produces the highest maximum point at 1.08%.

However, LLP obtained a rate at 0.03%, maximum of 0.07% and minimum at 0.01%. The mean of NII was 0.08% with maximum of 0.12% and minimum rate of 0.04%. Lastly IRS achieved a rate of 13.42%, maximum of 20.69% and minimum was at 4.62%.

### 13 b) Correlation Matrix

The correlation analysis was performed to measure the strength and direction of the linear relationship between the two variables.

In this study there is strong multi-collinearity among variables as reflected by the coefficient of 0.57 which is close to 1. The correlation tests show a negative relationship between the bank performance variables under study, which are return on assets and operating expense. It also shows a positive relation between the explanatory variable except that of LLP and IRS.

## 14 c) Stationarity Tests

The stationarity or unit root test of the data used in this study is conducted using Augmented Dickey Fuller Test and the results are shown below. The study compared test statistic value with that of test critical value at 5% significance level considering p-value and it has been indicated that the three variables ROA, OE and NII had unit roots. This is because the absolute values of the ADF test statistic for each of these variables were less than the absolute values of the test critical values at 5%. In addition, the p-values corresponding to each of the ADF test statistics for these variables were greater than 5% (0.384, 0.996 and 0.051), respectively. In this case, the null hypothesis of no unit roots in the data series could not be rejected and therefore accepted. However, the variables with unit root have been transformed into first difference to bring stationarity in these data, thereafter the modified data was used in the regression model in the study. 5 and 6 below show the estimated results demonstrating the coefficient values of the explanatory variables as well as indicating how each respective variable impacts the dependent variable. According to the estimated model above, the relationship between return on assets and LLP/BA ratio shows a negative relationship with a coefficient value of -0.227, against a P-value of 0.3190. This indicates that a unit decrease in LLP/BA ratio would result in an increase in the bank performance by 22.7%. This, however, is statistically insignificant. In the table 5, NII/BA ratio exhibits a significant positive relationship with ROA with a coefficient value of 0.895, against a P-value of 0.0005. This means that a unit increase in NII/BA ratio would result in an increase in bank performance by 89.5% which is a substantial increment in performance. The result again indicates that the IRS has a negative relationship with ROA with a coefficient value of -0.001 with a P-value of 0.1136. It implies that a unit decrease in IRS would increase bank performance by 0.1%. The result is, however, statistically insignificant. Table 6 below reveals that the second measure of bank performance, OE/OI has a negative relationship with LLP/BA ratio and is significant at 5% significant level. This means that as the independent variable increases bank performance decreases. Again, NII/BA ratio had a negative relationship with bank performance. This also means that as the ratio of the independent variable increases it pushes the bank performance which is measured in terms of expense down. Finally, the IRS also has a positive relationship with bank performance, an indication that when IRS increases bank expense income ratio also increases. When expense income ratio increases it means that the bank's position has worsened.

## 15 VI. Conclusions and Recommendations

Banks should endeavor to improve on loan performance to increase bank performance in terms of earnings on assets. Also a higher quality of loans would result in increase in net interest income and for that matter higher return on assets. Again for banks to enhance performance, they must make the effort to reduce interest rate spread. This is because, a high interest rate spread has the tendency to impact negatively on bank performance.

The second measure of bank performance indicates that when loan loss provision ratio to bank assets reduces operating expenses ratio to operating income increases indicating that when loan loss reduces either operating income reduces or operating expense increases. This means that for Loan loss to go down more expense has to be made in relation to income. Even though the other relationships are not significant the signs of the coefficients indicate that when NII ratio is low, operating expenses ratio increases and so for bank performance to improve, they must increase their net interest income. Finally, bank operating income may fall in relation to operating expense if interest rate spread increases and vice versa. This means that banks would be better off when interest rate spreads are low. This supports the result obtained above in relation to return on assets.

1

|              | ROA      | OE       | LLP      | NII      | IRS       |
|--------------|----------|----------|----------|----------|-----------|
| Mean         | 0.056283 | 0.563577 | 0.031647 | 0.081311 | 13.42241  |
| Median       | 0.055401 | 0.464961 | 0.029250 | 0.085353 | 14.16000  |
| Maximum      | 0.096818 | 1.078723 | 0.073122 | 0.123945 | 20.69000  |
| Minimum      | 0.022950 | 0.278730 | 0.010094 | 0.049534 | 4.620000  |
| Std. Dev.    | 0.020118 | 0.260718 | 0.014942 | 0.015127 | 4.208206  |
| Skewness     | 0.298583 | 0.881623 | 0.725000 | 0.232715 | -0.574325 |
| Kurtosis     | 2.128637 | 2.324754 | 3.513216 | 3.792815 | 2.768945  |
| Jarque-Bera  | 1.348356 | 4.307702 | 2.858784 | 1.021261 | 1.658780  |
| Probability  | 0.509575 | 0.116036 | 0.239454 | 0.600117 | 0.436315  |
| Observations | 29       | 29       | 29       | 29       | 29        |

Figure 1: Table 1 :

2

|     | ROA       | OE        | LLP       | NII       | IRS       |
|-----|-----------|-----------|-----------|-----------|-----------|
| ROA | 1.000000  | -0.523399 | 0.087717  | 0.574944  | -0.151740 |
| OE  | -0.523399 | 1.000000  | -0.578919 | -0.350311 | 0.208591  |
| LLP | 0.087717  | -0.578919 | 1.000000  | 0.362828  | -0.047534 |
| NII | 0.574944  | -0.350311 | 0.362828  | 1.000000  | 0.142863  |
| IRS | -0.151740 | 0.208591  | -0.047534 | 0.142863  | 1.000000  |

Figure 2: Table 2 :

3

|     | ADF Test Statistics | Test Critical Value at 5% *P<br>-Value |       |
|-----|---------------------|----------------------------------------|-------|
| ROA | 1.776337            | 2.971853                               | 0.384 |
| OE  | 1.093905            | 2.986225                               | 0.996 |
| LLP | 3.520189            | 2.971853                               | 0.015 |
| NII | 2.971589            | 2.971853                               | 0.050 |
| IRS | 3.020515            | 2.971853                               | 0.045 |

\*Mackinnon (1996) one-sided p-values

Figure 3: Table 3 :

4

|     | ADF Test Statistics | Test Critical Value at 5% | *P -Value |
|-----|---------------------|---------------------------|-----------|
| ROA | 5.311283            | 2.976263                  | 0.000     |
| OE  | 5.160904            | 2.986225                  | 0.000     |
| NII | 6.957254            | 2.986263                  | 0.000     |

\*Mackinnon (1996) one-sided p-values

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Figure 4: Table 4 :

5

| Variable           | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------------|-------------|------------|-------------|--------|
| LLP                | -0.226866   | 0.223125   | -1.016763   | 0.3190 |
| NII                | 0.894565    | 0.222425   | 4.021864    | 0.0005 |
| IRS                | -0.001223   | 0.000746   | -1.639781   | 0.1136 |
| C                  | 0.007141    | 0.018543   | 0.385128    | 0.7034 |
| R-squared          | 0.410765    |            |             |        |
| Adjusted R-squared | 0.340057    |            |             |        |

Figure 5: Table 5 :

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**6**

| Variable           | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------------|-------------|------------|-------------|--------|
| LLP                | -8.652182   | 2.912911   | -2.970287   | 0.0065 |
| NII                | -3.463193   | 2.903773   | -1.192653   | 0.2442 |
| IRS                | 0.013241    | 0.009738   | 1.359811    | 0.1860 |
| C                  | 0.941255    | 0.242080   | 3.888199    | 0.0007 |
| R-squared          | 0.402031    |            |             |        |
| Adjusted R-squared | 0.330275    |            |             |        |

Figure 6: Table 6 :





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