International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

http://ijpsat.ijsht-journals.org
Vol. 30 No. 1 December 2021, pp.239-245

The Link between Credit Risk and Profitability of Universal Banks in Ghana

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Abstract – Credit risk has been cited by scholars and reputable credit rating organisations as one of the major contributory factors to financial crisis – especially, within the banking sector – due to its pronounced effect on firms' profitability. Nevertheless, stakeholders within Ghana's financial sector seemed to lose grip of the relationship between credit risk and profitability; possibly due to paucity of empirical literature in this area. Thus, this study assessed the relationship between credit risk and profitability of universal banks in Ghana, employing annual data for the period 2011 – 2020 from 22 universal banks selected using the criterion sampling technique. The Ordinary Least Squares (OLS) was used for estimation of the relationship between credit risk and profitability. Credit risk was proxied by nonperforming loans to loans and advances (NP/LA), loans and advances to total deposits (LA/TD) and provision for loan loss to net loans (PLL/NL), whilst profitability was measured by return on assets (ROA). Results revealed NP/LA and LA/TD to have significantly positive effects on ROA, whilst PLL/NL was negatively associated with ROA. Overall, the findings pointed out that credit risk influences firm profitability, and thus, management of universal banks in Ghana are required to take pragmatic steps towards minimising the threats posed by credit risk.

Keywords – Credit risk, profitability, universal banks, crisis, Ghana, financial sector.

I. INTRODUCTION

Credit risk and profitability has become an important area of focus, subsequent to the global financial crisis of 2008. Credit risk has been cited by numerous scholars and researchers as being one of the causes of all forms of financial and economic downturns experienced worldwide (Stubley, 2018; Polat, 2012). It has, in most cases, affected the profitability of financial institutions; especially, banks. Also, credit risk and its associated impacts on banks' performance, financially, have been devastating (Polat, 2012). According to Polat, the devastating impacts of credit risk have caused loss of sureness in the financial system, preventing healthy operations of credit mechanisms. Bank credits to individuals, households, and business firms have been disrupted (Bhanot, Burns, Hunter, & Williams, 2014).

Credit risk has wreaked havoc on many universal banks in Ghana (Boadi, 2018; Atinyo, 2021). According to Nyavor (2018) and Sikasem (2017), credit risk is termed as failure of borrowers to pay back loan principal and required interest to lenders – banks in this context – leading to disruption to lenders' cash flows and increase in collection costs. In many cases, borrowers

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default on their loan obligations to banks, and securities issuers default on their obligations to banks holding their securities. These, according to Cucinelli (2015), also fall within the brackets of credit risk. Profitability, on the other hand, has been widely used to measure banks' financial performance, as it evaluates how successful a firm is (Danson, 2012; Berrios, 2013; Leung, & Horwitz, 2010).

It should be pointed out that the possible causes – particularly credit risk – of financial crisis, if left without critical analysis and lasting solutions implemented, the crisis may reoccur in the future, just as experts have predicted that the next global financial crisis could begin in 2020 (Stubley, 2018; Hearit, & Hearit, 2020). Reoccurrence of this crisis can be more devastating, and may utterly collapse the banking systems across the globe. For instance, currently, in the case of Ghana, the financial sector is left with only 23 universal banks, 135 rural or community banks, and 11 savings and loans or microfinance institutions (Stephen, 2018; Nunoo, 2020). This has reduced volume of business in the country, leading to low revenue generation, and eventual halt of operations of some business firms.

Despite the seeming influence of credit risk on financial crisis through its relationship with profitability as could be inferred from the assertions of the credit market theory (Patnaik, & Vasudevan, 1998), firm characteristics theories (Godlweski, & Ziane, 2008) and the loan pricing theory (Stiglitz, & Weiss, 1981), gaps exist in literature concerning the link between credit risk and profitability. Prior empirical studies focused mainly on developed countries (Bhanot et al., 2014; Polat, 2012; Roy, & Kemme, 2012; Veronesi, & Zingales, 2010; Ueda, & di Mauro, 2010). Thus, the need to carry out a study to determine the effect of credit risk on profitability, considering a less developed country is crucial. Most of the studies conducted in Ghana focused only on the challenges of banks, such as lack of enabling environment (Nyavor, 2018), lack of government support (Allen, 2011), and high taxes (PwC, 2018). Others focused on post-financial crisis (Asamoah, & Owusu-Agyei, 2020) without a focus on credit risk and profitability.

Empirically, studies which have analysed the link between credit risk and profitability of universal banks in Ghana seem nonexistent, to the best of the researcher's knowledge. This study, therefore, seeks to address this gap by analysing the effect of bank credit risk on profitability of universal banks in Ghana. This study, apart from bringing to bare insights on bank credit risk issues to equip bankers and management with how to plan and run credit risk-free operations, and to save profits and cash flows, would contribute immensely to literature. Though the researcher considered only banks with complete data set, the results have implications for even the banks which did not meet the data requirements, and any other institutions involved in advancing credits. Financial regulatory policymakers would also pick intelligence from the findings and apply it in executing their policy-making activities. Further, Ghana is facing financial challenges; thereby, denying the youth employment into the public sector (Ofori-Atta, 2021); thus, a robustly operational financial system devoid of credit threat could help reduce unemployment rates and contribute to achieving the first target – poverty eradication – of the Sustainability Development Goals within the set time (United Nations (UN), 2015).

II. Materials and Methods

The quantitative approach was employed, making use of the explanatory design as it upholds predictions and causal explanations (Creswell, 2013; Garson, 2012). Since this study sought to assess relationship between variables, credit risk and profitability, this design was deemed appropriate (Creswell, 2013). The criterion sampling technique was used to select 10 out of the 23 universal banks in Ghana (Nunoo, 2020; Owusu, 2019), based on availability of complete data – 2011 to 2021 – rating (Corporate Financial Institute, 2020). The data used were extracted from the annual reports (2011 – 2021) of these banks; these produced 100 observations (10banks ×10year). Credit risk was proxied by ratio of nonperforming loans to loans and advances (NP/LA), ratio of provision for loan loss to net loans (PLL/NL) and loans and advances to total deposits (LA/TD), and profitability proxied by return on assets (ROA) computed as the ratio of net income to total assets (Kargi, 2011; Ago, 2012).

To accurately and systematically analyse the quantitative data for this study, the Ordinary Least Squares (OLS) method was used, as this technique has some optimal and computational properties that help in the production of optimum estimates (Ago, 2012). The Eviews (Version 10) was employed for the processing. The regression equation estimated is as shown below.

$$ROA = f\ (NP/LA,\ LA/TD,\ PLL/NL) \qquad \text{[Equation 1]}$$

$$ROA_t = \beta_0 + \beta_1(NP/LA)_t + \beta_2\,(LA/TD)_t + \beta_3(PLL/NL)_t + \varepsilon_t \qquad \text{[Equation 2]}$$

'*A priori expectation*': $\beta_1 < 0$; $\beta_2 > 0$, and $\beta_3 < 0$

III. Results and Discussion

3.1. Descriptive statistics

The descriptive statistics for the sampled 10 universal banks for the period 2011 – 2020 is presented in Table 1. From the table, the average of return on assets for the 10 universal banks was 0.0279 of all assets, with a degree of variability of 0.0136 units. This average was defined my median, maximum, and minimum of 0.0300, 0.0500, and -0.0200 units, correspondingly. Considering the mean and its characteristics, it is clear outliers' effects are not substantial and obvious. The mean of ratio of provision for loan loss to net loan was 0.0523±0.0457SD units. This was characterised by a maximum value of 0.2100 units, minimum of 0.0100 units, and a median value of 0.0300 units. The average rate of ratio of non-performing loans to loan and advances was 0.0506±0.0332SD units, characterised by a maximum value, minimum value, and median value of 0.2100, 0.0200, and 0.0400 units, respectively. The average recorded for ratio of loans and advances to total deposits was 0.6677 (SD = 0.1701; median = 0.6700; max. = 0.9100; min. = 0.3400).

Table 1: Descriptive statistics

Variable	Mean	Median	Max.	Min.	SD
ROA	0.0279	0.0300	0.0500	-0.0200	0.0136
PLL/NL	0.0523	0.0300	0.2100	0.0100	0.0457
NP/LA	0.0506	0.0400	0.2100	0.0200	0.0332
LA/TD	0.6677	0.6700	0.9100	0.3400	0.1701

Source: Annual reports (2011 – 2020) Obs. = 100

Max. = maximum; Min. = minimum; SD = standard deviation

3.2. Correlation Results

Correlation matrix was presented in Table 2 for profitability variable, herein, ROA, and credit risk variables, PLL/NL, NP/LA and LA/TD. The independent variables in the matrix are PLL/NL, NP/LA and LA/TD, whilst the dependent variable is ROA. From the table, it could be seen that the independent variables showed weak correlation, all below correlation coefficient of 0.7, with the dependent variable, ROA. LA/TD and PLL/NL were negatively associated with ROA as NP/LA related positively with ROA. Also, the correlation coefficient between the variables of interest, the independent variables, all fall within the required range as proposed by scholars. Bryman and Cramer (2001) proposed a cutoff of 0.80 to avert issues of multicollinearity; Anderson, Sweeney and Williams (1990) proposed 0.70, and Kennedy (2008) argued 0.90 as a cutoff. Thus, even taking the position of the lowest proposition, 0.70 (Anderson et al., 1990), it could be concluded that there was no issues of multicollinearity between the study variables.

Table 2: Correlation matrix

Variables	ROA	NP/LA	LA/TD
ROA			
NP/LA	0.1438		
LA/TD	-0.0922	0.1305	
PLL/NL	-0.0588	0.0037	0.0372

Source: Annual reports (2011 – 2020)

3.3. Regression Analysis

To determine the effect of credit risk on profitability, using the measures NP/LA, LA/TD and PLL/NL for credit risk, and ROA as a proxy of profitability and dependent variable, the regression results were estimated and presented in Table 3. Also, the significance level of the study variables, statistically, was maintained at 5%. All the estimations run for the relationship between

credit risk variables and profitability variable showed no correlation with the error term. Unit root test was conducted and the null hypotheses were rejected at a significance level of P<0.05. These suggest that the data used for the estimation were reliable.

From Table 3, it is obvious that the regression model has a predictive power. The R-squared and the Adjusted R-squared are 19.17% and16.64%, respectively. This means, overall, and collectively, the predictor variables explain 16.64% of variations in the dependent variable, ROA. The overall explanatory power of the model is significant at F-stats of (t = 7.5879, P = 0.0001). Considering these, holding all other factors constant, the model is deemed fit for the estimation. The results also showed that there is a statistically significant effect of NP/LA on ROA of universal banks in Ghana at a significance level of P = 0.0024 (t = 3.1178) which is less than α = 0.05. Likewise, the results showed a significant effect of LA/TD on ROA of universal banks in Ghana at a significance level of P = 0.0230 (t = 2.3099). Further, the results revealed a statistically significant of PLL/NL on ROA at significance level of P = 0.0336 (t = -2.1552).

Table 3: Regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NP/LA	2.5573	0.8202	3.1178	0.0024
LA/TD	0.3696	0.1600	2.3099	0.0230
PLL/NL	-1.2787	0.5933	-2.1552	0.0336
C	-0.1464	0.1172	-1.2490	0.2147
R-squared	0.1917			
Adjusted R-squared	0.1664			
S.E. of regression	0.2684			
F-statistic	7.5879			
Prob(F-statistic)	0.0001			

Source: Annual reports (2011 – 2020)

3.3.1. Ratio of non-performing loans to loans and advances (NP/LA) and return on assets (ROA)

The outcomes as presented in the model, as displayed in Table 3, showed that at 5% significance level, ratio of nonperforming loans to loans and advances has a significant positive relationship with return on assets of sampled universal banks in Ghana. Specifically, a unit increase in ratio of non-performing loans to loans and advances will result in a 2.5573 units increase in the return on assets of the sampled universal banks. The implication of this finding is that, practically, when the universal bank borrowers default on payment of their periodic installments and loan principals, and these values continue to appreciate relative to total loans and advances, net income of the banks relative to their total assets is likely to increase.

This finding is inconsistent with Stiglitz and Weiss's (1981) loan pricing theory which suggests a negative relationship. The finding also shows inconsistency with Patnaik and Vasudevan's (1998) credit market theory which proposes an inverse relationship between ratio of non-performing loans to loans and advances, as a measure of credit risk, and return on assets, measuring profitability. Further, the finding has violated the researcher's *'a priori expectation'*, which expected a negative relationship between NP/LA and ROA. However, the finding correlates with Brewer's (2014) findings where he posited that, banks' profitability increases as they accumulate more non-performing loans on their records.

This result might be possible due to the fact that as banks lend to borrowers who have the propensity to default on their obligations, the banks are counteracting, as a way of taking preemptive action, by making more viable investments which yield more than proportionate returns for the banks; therefore, the non-performing loans do not have severe impact on the overall average returns of the banks, thereby, making the universal banks see increase in their ROA even though non-performing loans might be appreciating. This is buttressed by the assertion of Brewer (2014) that banks with a high quality risk management team can turn risk

into returns, and that the fact that risk has increased does not mean income should fall. The theories' positions might have been violated because of the differences in the economic and financial environments of the study locale where the theories were tested and the current study locale. Also, the sample size might have implications for the violations of the positions of the underpinning theories for the current study.

3.3.1. Ratio of loans and advances to total deposits (LA/TD) and return on assets (ROA)

The results, as presented in Table 3, showed that at $\alpha = 0.05$, ratio of loans and advances to total deposit has a significant positive relationship with return on assets of sampled universal banks in Ghana ($P < \alpha = 0.05$). Specifically, a unit increase in the ratio of loans and advances to total deposit leads to a 0.3696 units increase in return on assets of the universal banks sampled, for the periods 2011 to 2020. Empirically, the implication of this finding is that, when the universal banks advance more loans to their clients, holding total deposits constant, the management of the banks are able to put strategies in place to get clients to pay their interest installments, thereby, contributing to increase in the net income of the banks – in the form of interest income; though analysis of the statement of financial position items of loans and deposits may show unfavourable ratio.

This finding does not correlate with the loan pricing theory which suggests a negative relationship between risk and profitability (Stiglitz, & Weiss, 1981). The finding also displays inconsistency with the credit market theory (Patnaik, &Vasudevan, 1998) which posits an inverse relationship between credit risk measures and profitability measures. However, the finding shows consistency with the researcher's '*a priori expectation*' which expected a positive relationship between LA/TD and ROA. Also, the finding agrees with the firm characteristics theories which assert that credit risk can have any effect, negative or positive, on profitability depending on the risk management approaches of the firm under discussion (Godlweski, & Ziane, 2008).

This finding could be due to the fact that, though universal banks may be risking liquidity, they are able to benefit from interest incomes and use same for investments which eventually culminate in increase in the return on assets of the banks. This position is corroborated by the stance of the firm characteristics theories that whether risk factors impact firms adversely or not is dependent on the management characteristics of the firm involved (Godlweski, & Ziane, 2008). The dissimilarity between the finding of this study and that of other related prior studies may be due to influences of the study environment and how the sampled universal banks considered in the studies operate, as well as the quality and volume of information made available by the sampled banks.

3.3.2. Ratio of provision for loan loss to net loans (PLL/NL) and return on assets (ROA)

The finding displayed in Table 3 shows that at a 5% significance level, ratio of provision for loan loss to net loans has a significant negative relationship with return on assets of universal banks in Ghana. The result shows a unit increase in ratio of provision for loan loss to net loans will result in a 1.2787 units decrease in the return on assets of the sampled universal banks. This finding implies that, in actuality, when the banks increase their provision for loan loss, this provision is set against the gross profits of the banks, thereby leading to a decreased net income which in turn would produce a decreased return on assets ratio, holding total assets of the banks constant.

This finding upholds the positions of the loan pricing theory (Stiglitz, &Weiss, 1981) and the credit market theory (Patnaik and Vasudevan, 1998) which suggest a negative relationship between credit risk and financial performance measured using profitability indicators. Further, the finding has upheld the '*a priori expectation'* suggested by the researcher, which expected a negative relationship between PLL/NL and ROA. However, the finding contradicts the study by Salah and Fedhila (2012) which found and concluded that increase in ratio of provision for loan loss to net loan, in the long-run, would lead to a fall in profitability measures of banks, and the reverse is true.

Interestingly, this finding seems to be consistent with the assertions of all the underlying theories employed for the study. This finding can further be explained by making reference to accounting and financial management practices of the banks in that when provision for loan losses is increased unnecessarily relative to net loans, the net income of the banks will likely suffer unnecessary decrease culminating in a fall in the overall return on assets ratio, holding constant the total assets of the banks (Patnaik, &Vasudevan, 1998). Just as posited by the firm characteristics theories, management practices and characteristics account for the influence of credit risk on profitability of banks. Studies with different findings might have researched banks whose management characteristics differ from those considered by the current study.

IV. CONCLUSION

The Ghanaian financial institutions – predominantly banks – faced a financial crisis which led to closure of many domestic banks by the Bank of Ghana. Partly, the crisis was attributed to bank credit risk which led to loss of liquidity. Many investors lost their investments; jobs and livelihoods were lost, and lives stood still. However, no study has empirically investigated the relationship between bank credit risk and profitability, in the light of the crisis. It was due to this background that the current study was motivated to assess the effect of credit risk on profitability of universal banks in Ghana. Employing the quantitative method and the explanatory design, using the ordinary least squares techniques for model estimation, the study analysed the annual data of 10 universal banks, for the periods 2011 – 2020, and the following conclusions were drawn from the findings.

First, it was found that profitability, expressed as return on assets, per this study, is directly influenced by nonperforming loans, expressed as a ratio of loans and advances; implying that high values of non-performing loans result in increased profitability of universal banks in Ghana. Second, loans and advances, expressed as a ratio of total deposits, positively influence profitability of universal banks in Ghana; thus, concluded that banks' profitability improves as they increase loans and advances to clients. Finally, provision for loan loss adversely influences banks' profitability; suggesting that when universal banks increase allowance for loan loss, their profitability dwindles. Conclusively, the kind of effect credit risk can have on banks' profitability is determined by strategies championed by the managers, as well as how credit risk is perceived, in terms of measurement. These findings have implications for banks, non-banks, individuals, and financial regulatory bodies. Further studies can look at the effect of credit risk on liquidity of banks in Ghana.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Conflict of Interest: The author declares no conflict of interest.

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