

Non-Performing Loan and Liquidity of Universal Banks: Does Minimum Capital Requirement Matters?

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Abstract

This study departs from empirical studies which had focused on the effect of non-performing loan on the performance of banks to the neglect of liquidity of banks. In the wake of the recent collapse of universal banks which has engulfed the Banking sector of Ghana, this study analyse the effect of non-performing loan on liquidity of universal banks in the context of the constant revision of the minimum capital requirement by the central bank. The cross sectional time series design was adopted and the census sampling was used to collect data from twenty banks for the period of 2008 to 2017. The outcome of the study showed that, Non-performing loan (NPL) and Capital adequacy ratio (CAR) positively influence the liquidity of the universal banks using working capital management practice, poor provision, ownership structure, bank size and loan growth as controlling variables. From this backdrop, it is empirically established that, minimum capital requirement indeed matters in the liquidity management of universal banks. It is therefore strongly recommended that the central bank should organise training programmes for the universal banks on fund management in other to have a balance funds in non-current asset and cash to avoid the negative effective on bank panic on their operation.

Keywords: Non-Performing loan, Cross sectional time series, Liquidity, Minimum Capital Requirement.



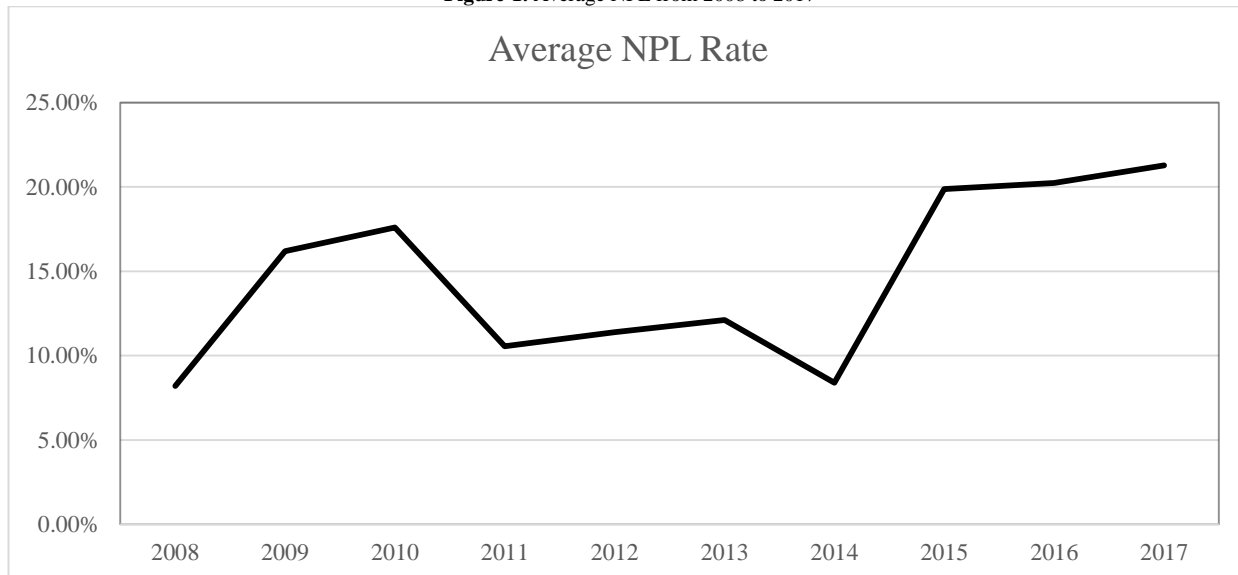
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1. Introduction

In today's global industrialization, the role of the financial sector especially banks cannot be over-emphasised. Among the several categories of banks, universal banks play a significant role in emerging economies where most borrowers have limited access to investment hub (Zhang *et al.*, 2016). There is evidence also to show that a well-functioning commercial banks speed up economic growth, while poorly-functioning ones are impediment to economic development and exacerbate poverty (Hu and Xie, 2016). Moreover, as a deposit taking institution, loans make up the bulk of banks' assets. This is usually evidenced by the large proportion loans constitute in the overall operating assets of the lending institutions (Epure and Lafuente, 2015). Healthy loan portfolios are vital for the progress of lending institutions in view of their effect on earnings and liquidity of banks. For this reason, interest on loans contributes significantly to the interest income of commercial banks and improves on the liquidity management of the banks. But the process of earning more revenue is shortchanged by Non-Performing loans (NPLs) usually as a result of default from borrowers which leads to the bad loans menace.

The challenges of NPLs is a global phenomenon, since it transcend all the continent. For instant Ernst and Young (2013) revealed that, Europe is emerging as an NPL market in its own right, with an estimated €1 trillion of NPLs on the balance sheets of the region's banks In the United States, non-current loan balances remain high despite a reduction in non-current loans to US\$276.8 billion from US\$292.8 billion at the end of the fourth quarter of 2012, such loans are still about 2.5 times higher than when the recession even started in December 2007 (Ernst and Young, 2013). Among the countries in the Asian continent, the rate of NPLs as a percentage of total loans disbursed in 2016 is seen to be minimal in India (5.2 percent), followed by Sri Lanka (9.6 percent). Bangladesh, however, still records staggering rate of 13.56 percent (Adhikary, 2006). The spate of bad loans was as high as 35 percent in Nigerian Commercial Banks between 1999 and 2004 (Mugwe and Oliweny, 2015). From this backdrop, it is objective to conclude that the challenges NPLs is precarious globally; therefore the intervention of an empirical study on its effect on the liquidity management to avert a possible bank panic across the globe.

The issue of NPLs is not alien to the Financial System of Ghana which is bank-dominated with universal banks accounting for 75 percent of the total assets of the financial system, and currently providing financial services to about 26 percent of the country's population (Bank of Ghana Monetary Policy Report, 2017). However, the coming into force of the Banking Acts, Amended Act, 2007 (Act 738), has made it possible for the commercial banks to operate as universal banks by raising the required stated capital of GH¢ 70 million to GH¢ 120 million (Bank of Ghana Monetary Policy Report, 2010). A key result of compliance with this directive was that bank lending increased from GH¢1.055billion in 2007 to GH¢2.464 billion in 2010 (Bank of Ghana Monetary Policy Report, 2010). The adjustment in the minimum capital requirement did not however resolve the bad loans menace and the effects on banks performance, as the Bank of Ghana's classifications of advances of the Banking industry indicate that unsecured loans in the loss category increased from GH¢125, 196,732 in December 2007 to GH¢204, 978,569.00 in December 2008, indicating over 63 percent jump in bad loans (Bank of Ghana Monetary Policy Report, 2010; Obuobie and Pollio, 2010). Again, figures from BoG between the years 2007 to 2017 on the aggregate percentage of NPLs give the following trend in Figure 1

Figure-1. Average NPL from 2008 to 2017

Source: Extracted from Bank of Ghana Annual Report (2017)

From the figures above, NPLs increase steadily from 8 percent in 2008 to as high as 17.8 percent in 2010 before it took a downward trend again to a low of 6.7 percent in 2014, and began rising again until it reached a peak of 21.78 percent in 2017. The Non-Performing Loans (NPL) of the banking industry for half year also reached 13.4 percent in July 2018 against 16.4 percent in July 2017. Similarly, loan loss provision to gross loans also declined to 6.3 percent in July 2018 compared to 8.7 percent in July 2017. The ratio of NPL net of provisions to capital of 12.9 percent in July 2018 also indicated an improvement over the July 2017 position of 13.7 percent (Bank of Ghana Monetary Policy Report, 2018). From Figure 1 it can be seen that the initial result is a reduction in the non-performing loan rate but this subsequently increase from 2012 leading to about five bank been taken over by the Bank of Ghana Monetary Policy Report (2017). In the process of strengthening the industry and protection of the customers of the banks, the Bank of Ghana has recently raised the minimum capital requirement to GH¢400 million, equivalent to about US\$100 million. Universal/commercial banks in the country have up to December 2018 to raise the amount, which represents a 333.3 per cent increase from the current minimum capital of GH¢120 million. stated capital increased from GH¢ 120 million in 2017 to GH¢ 400 million equivalent to US\$100 million in 2018.

The effects of non-performing loans on the economy of Ghana have been drastic. The Bank for Housing and Construction, and the Bank for Saving and Cooperative collapsed due mainly to the problem of non-performing loans. Also the Social Security Bank and The Trust Bank, both state owned banks with connection to the Social Security and National Insurance Trust were acquired by the Societe Generale and the Ecobank respectively citing the issue of non-performing loans as the major reasons for the disposal of the shares. In 2017 five universal banks have been taken over by the central bank citing among other reasons non-performing loans. NPLs are always a source of misery for lenders because it can adversely affect its operations in terms of liquidity, profitability, return on assets and equity, debt- servicing capacity, lending capacity, interest charges and ability to raise additional capital. The above analysis shows that no economy or financial institution can be absorbed from the threats of challenge posed by non- performing loans on its operations and survivability. In the light of the above, the issue of bad loans has raised some concerns among stakeholders in the banking institution, hence with the recent increase in the minimum capital requirement by the central bank of Ghana, the study seeks to establish the determinates of NPL and its effect of the liquidity of the banks does the minimum capital requirement matter? From this backdrop, the objectives are to examine the effects of non-performing loans on the liquidity of the universal of banks.

2. Review of Relevant Literature

2.1. Lemon Theory

The market of lemons theory was propounded by George Akerlof (1970), in which Akerlof notes that the owner of a lemon knows more about its quality than any potential buyer(s). Asymmetric information between the bank and the investor about the actual characteristics of the investment being made, coupled with the instability of the market and global environment lead to problem loans management. According to Akerlof, asymmetric information exists when one side of the market possesses information lacked by other players in that market. Information asymmetry also refers to a situation where business owners or managers know more about the scenario, for and risk facing, their business than do lenders. Information asymmetry further describes the condition in which relevant information is not known to all parties involved in an undertaking (Haneef and Riaz, 2012). Asymmetric information has been used extensively to explain a diversity of concept, including those in different market condition (Boudriga *et al.*, 2009). The theory further posits that in the market, the person that possesses superior information on a particular item to be transacted (in this case the borrower) is in a better position to negotiate optimal terms for the transaction than the other party (in this case, the lender) leading to payment default. Certainly these defaulters thrived in the “information asymmetry” environment that prevailed due to lack of a credit information sharing mechanism. Assuming the

hypothesis of the efficiency of the market, the only significant factor worth considering is information asymmetry. This leads us to adverse selection and moral hazard, both consequences of the attempt to overcome information asymmetry. Adverse selection and moral hazards have both led to significant accumulation of non-performing loans in banks (Aker and Roy, 2017; Azofra and Santamaria, 2011). The Kenyan banking sector for instant was in the 1980's and 1990's weighed down with a momentous non-performing assets portfolio, which led to the liquidation of certain banks. One of the promoters in this situation was serial defaulters, who borrowed from a range of banks with no purpose of repayment.

Adverse selection occurs because of information asymmetries and difficulties in selecting the right customers. According to Akerlof (1970), adverse selection implies that there are qualitatively different types of credit seekers. In contrast with high quality borrowers, low quality borrowers are not capable to use the borrowed money for valuable investment and they will have a relatively large chance to fail on repayment of the loan. Banks consequently prefer to select high quality credit seekers and the major way of examining a potential borrower is by analyzing all available information (Hayne and Pyle, 1977). The selection challenge results from the behavior of low quality applicant that presumes to submit high quality project but do not forward all relevant negative information. Zhang *et al.* (2016) tested adverse selection and moral hazard in consumer loan markets and found evidence of adverse selection, with borrowers self-selecting into contracts which affects repayment later. On the other hand, Hu and Xie (2016) opined that information sharing reduces adverse selection by improving banks information on credit worthiness of applicants. In the adverse selection model developed by Hu and Xie (2016), information sharing improves the pool of borrowers, reduces defaults and decreases interest rates. It can also lead to growth of lending.

When banks are local monopolists, however, in some cases lending reduces, because the exchange of credit information increases the banks' possibility of price discrimination between safe and risky borrowers and the increase in lending to safe borrowers does not fully compensate for the reduction in that too risky types. When credit markets are competitive, lending activity is more likely to increase: competition limits the banks' ability to charge more interest from their customers and information sharing increases banking competition. By reducing information asymmetry between lenders and borrowers, and credit registries allow loans to be extended to safe borrowers who had previously been priced out of the market, resulting in higher aggregate lending. In this vein, the Bank of Ghana for instant has opened a credit registry to keep records on businesses and enterprises to reduce this information asymmetry by providing available information on borrowers' credit worthiness. Moral hazard is defined as the risk that the existent of a contract will change the behaviour of one or both parties to the contract, or a risk to a financial institution resulting from uncertainty about the honesty of the insured (as in insurance) or the borrower (as in banking). The moral hazard problem implies that a borrower has the incentive to default unless there are consequences for his future applications for credit. This result from the difficulty lenders have in assessing the level of wealth borrowers will have accumulated by the date on which the debt must be repaid, and not at the moment of application. If lenders cannot assess the borrowers' wealth, the latter will be tempted to default on the borrowing. Forestalling this, lenders will increase rates, leading eventually to the breakdown of the market. (Gadzo and Gatsi, 2013).

According to Gatsi *et al.* (2016), if the concept of moral hazard is applied to a lending and borrowing circumstance, it means that the customer to whom a loan has been extended controls the money of the lending institution. In such a situation, the customer may use the money for his own interest and not consider the percentage stake of the bank. Banks thus try to monitor their customers as all principals do with their agents, which however require some guarantees that proper information will be provided. Moral hazard models also imply that information sharing should reduce default rates and interest rates and increase lending of money, either because credit reference bureaus nurture competition by reducing informational rents, Zhang *et al.* (2016) or because they punish borrowers Gatsi *et al.* (2016).

2.2. Empirical Studies

Empirical studies argue that the effects of non-performing loans can be economic and fiscal, and that the costs of the impaired loans are momentous. Potentially, these loans may negatively affect the level of private investment, increase deposit liabilities and constrain the scope of bank credit to the private sector through a reduction of banks' capital, following falling saving rates as a result of runs on banks, accumulation of losses and correlative increased provisions to compensate for these losses (Fofack, 2005). The fiscal costs of these impaired loans are important as well, and vary with the scope and length of the crisis. The resolution of these loans losses is generally made through the creation of Asset Management Companies and/or deposit insurance schemes whose main function is to take over non-performing assets of distressed financial institutions. These Asset Management Companies and deposit insurance schemes are either private or government-owned entities set up through the budgets to provide financial assistance to problem banks. However, according to Kroszner (2002) most of these are state-owned, and their intervention in support of distressed financial institutions to avert banking crisis may therefore exacerbate the already high pressure on government revenues since they are funded through the budget.

This pressure is likely to be more important in Sub-Saharan Africa where most countries are confronted with a narrow fiscal base and limited prospects for increased domestic resource mobilization. According to Bexley and Nenninger (2012) a possible effect of bad loans is on shareholders earnings. Dividends payments are based on banks performance in terms of net profit. Thus since bad loans have an adverse effect on profitability of banks and the liquidity positions of the banks. The effect of bad loans on the amount of dividend paid to shareholders can also affect capital mobilization because investors will lose confidence in the bank and will not invest in banks that have huge non-performing loans portfolio. In a research conducted by Bloem and Gorter (2001) they realized that even

though issues relating to non-performing loans may affect all sectors of the economy, the most serious impact is on the liquidity positions of financial institutions such as commercial banks and mortgage financing institutions which tend to have large loan portfolios. Besides, the large bad loans portfolios will affect the ability of banks to advance credit facility. Huge non-performing loans could result in loss of confidence on the part of depositors and foreign investors who may start a run on banks, leading to liquidity problems.

Boudriga *et al.* (2009) opined that, Capital adequacy ratio (CAR) which is a proxy for minimum capital requirement reduces the level of problem loans which means higher CAR leads to less NPL and eventually increases the liquidity level of financial institutions.. However, the study by Goddard *et al.* (2004) on factors of profitability of banks in Europe, found a direct association between the CAR and profitability. Conclusively, the choice of CAR as proxies for minimum capital requirement is based on frequency in previous studies. CAR measures the amount of bank’s capital which is related to the amount of is risk weighted credit exposure and also legalized in Basel regulation and must be an imperative factor for minimum capital requirement. The provisions made for bad loans reduce total loan portfolio of banks and as such affect interest earnings on such assets. Boudriga *et al.* (2009) reported a significant correlation between credit risk and financial crises and concluded that credit risk had already started to build up before the onset of the 1997 Asian financial crisis, and became more precarious as non-performing loans increased Fofack (2005) also found this relationship to be significant. There is evidence that the level of non-performing loans in the United States started to increase substantially in early 2006 in all sectors before the collapse of the sub-prime mortgage market in August 2007 (Greuning and Bratanovic, 2010). It is also said that even before the Lehman Brothers collapsed in September 2008, the need for a fundamental strengthening of the Basel II framework had become apparent. The banking sector had entered the crisis with too much leverage and inadequate liquidity buffers. These defects were accompanied by poor governance and risk management, as well as inappropriate incentive structures. The combination of these factors was manifest in the mispricing of credit and liquidity risk, and excess credit growth. Gatsi *et al.* (2015) opined that, those non- performing loans can be used to mark the inception of a banking crisis. Despite ongoing efforts to control bank lending activities, non-performing loans are still a major concern for both international and local regulators (Boudriga *et al.*, 2009).

3. Research Methods

The research design adopted for the study is Causal design with the quantitative approach. The causal research design is appropriate because it explains the effects of Non -performing loans with time effect (Anaman *et al.*, 2017). Under the quantitative research approach, the cross sectional time series model was adopted since variables for many banks across different time periods is been used. The population of the study comprised all the commercial/ universal (in the context of Ghana) banks registered in Ghana from 2008 to 2017.The justification for this timeframe stems from the fact that, the Basel I and II adoption commenced immensely in Ghana during this period after the 2008 credit crunch. 20 banks were found during this period and for that matter the census sampling technique was adopted to select all the 20 banks for the analysis.

4. Empirical Model

The study employed theoretical model with necessary adjustment variables to test the reduced form of the econometric model similar to that of Jimenez and Saurina (2005) to ascertain the effect of NPL on the liquidity of the universal banks. This model has been used by other researchers like Hu and Xie (2016) and Wooldridge (2009) in other jurisdictions which yielded a consistent result.

$$Y_{it} = \alpha_i + \beta_1 X_{it} + e_{it} \tag{1}$$

Where; Y_{it} : Liquidity (LQ) (dependent variables) for bank i at time t .

α_i : the time-invariant firm specific effects,

X_{it} : the independent variables

β_1 : coefficients

e_{it} : a random disturbance

The general regression equation is of the form shown in equation (2)

$$LQ_{i,t} = \beta_{0i} + \beta_1 NPL_{i,t-1} + \beta_2 PP_{i,t-1} + \beta_3 CAR_{i,t-1} + \beta_4 OS_{i,t} + \beta_5 WCMP_{i,t} + \beta_6 BS_{i,t-1} + \beta_7 LG_{i,t} + \varepsilon_{i,t} \tag{2}$$

Table-1. The Summary of Variables used in the regression model

Variable	Definition
Non- Performing Loan (NPL)	The natural logarithms of the ratio of NPLs to Total Loans for bank i in time t .
Liquidity (LQ)	In line with the literature Bexley and Nenninger (2012); Zhang <i>et al.</i> (2016), this study also defines liquidity as the ratio of current assets over current liabilities (Liquidity = Current Assets * Current Liability).
Capital Adequacy Ratio	Bank Capital and Reserves divided by Total Asset
Poor Provisioning (PP)	Adopting the measurement by Greuning and Bratanovic (2010) the poor provision was measured by expressing the provision for each year as a percentage of the interest income after which it is compared to the acceptable bench mark of 20

	percent to determine poor provision.
Ownership Structure (OS)	Ownership structure in this study adopted the measure of Mugwe and Oliweny (2015) and Gatsi et al. (2015) who used '0' as a proxy for banks owned by the state and '1' for banks owned by the private sector upon a review of their board structure.
Working Capital Management Practices (WCMP)	The study recognised working capital management practice as the working capital management cycle, thus interest receivable period minus interest payable periods.
Bank Size (BS)	It is the relative market share of bank <i>i</i> of time <i>t</i> . $\text{Size}_{it} = \text{Assets}_{it} / \text{Total Assets}_{it} \times 100\%$
Loan Growth (LG)	Excessive lending by commercial banks is often identified as an important determinant of NPLs (Jimenez and Saurina, 2005 ; Salas and Saurina, 2002). Loan growth was measured as the percentage change in the loans over a given period of time.

Source: Adapted from empirical literature

4.1. Empirical Reasons for Choosing These Variables for the Regression

Empirical evidence suggests that several bank specific factors such as, size of the bank, profit margins, efficiency, the terms of credit (size, maturity and interest rate), risk profile of banks (measured by several proxies including total capital to asset ratio and loans to asset ratio) and moral hazard are important causes of NPLs. This study considers the following: the annual growth in loans ($\Delta LOAN$), poor provision (PP), ownership structure (OS), working capital management (WCM) and the size of the bank (*SIZE*). There is existing evidence in the literature that shows a strong positive relationship between NPLs and the ratio of loans to asset, which captures the risk appetite of banks ([Sinkey and Greenwalt, 1991](#)). The supporting rationale is that banks that value profitability more than the cost of higher risk (represented by a high loan to asset ratio) are likely to incur higher levels of NPLs during periods of economic downturn. This is because there will be reduction in the debt serving capacity of borrowers to pay for the loans. Existing literature also suggest that excessive lending by commercial banks is an important factor of NPLs, for instant ([Jimenez and Saurina, 2005](#); [Keeton, 1999](#); [Salas and Saurina, 2002](#); [Sinkey and Greenwalt, 1991](#)). The variable to get the loan growth is calculated by finding the annual percentage change in the loan portfolio for each bank ($\Delta LOANS$). This variable is expected to have a positive relationship with LQ since existing literature shows that rapid credit growth is often associated with higher NPLs. However, the empirical evidence from existing literature relating to the impact of bank size on LQ appears to be mixed. For instance, some studies report a negative relationship between LQ and bank size and CAR ([Hu and Xie, 2016](#); [Rajan and Dhal, 2003](#); [Salas and Saurina, 2002](#)). According to these studies, the inverse relationship means that large banks have better risk management strategies that usually translate into more superior loan portfolios compared to the smaller banks. Other studies however provide evidence of a positive relationship between bank size and NPLs ([Rajan and Dhal, 2003](#)), suggesting that the larger the bank the more loans become non-performing. The current work is aimed at finding this association between bank size and NPLs in the Ghanaian case.

5. Results and Discussion

The results and discussion is segmented into the descriptive statistics followed by the results of the two objectives this study sought to achieve. Table 2 provides a summary of the descriptive statistics of the dependent and independent variables which were measured in percentages. From the results liquidity (LQ) averaged 1.43. The variations within and among the banks are relatively reasonable as can be seen from the minimum and maximum values shown in Table 2 below. The table reveals a high-quality performance in the banking sector of Ghana during the period under investigation. The non-performing loan variable presents an interesting result in that during the period, the ratio of non-performing loan to total loans averaged 8.13 percent. This is not a very good position in respect of the banks used in the study in that, it implies that more than five percent of the loans given out to their customers are classified as non-performing loans and thus uncollectible. The import of this is that, the banks will find it difficult to finance their operational activities if majority of their loans are not returned by their customers. The situation is likely to lead to the liquidation, mergers and acquisition of well-known banks in Ghana. It can also affect the banks' ability to advance more loans to potential borrowers.

An important point that must be recognized is that over 5 percent of loans are non-performing, attesting to the fact that most banking firms largely depend on performing loans and care less for their non-performing loans ([Bloem and Gorter, 2001](#)). This trend is also important as a result of the under-developed nature of the Ghanaian debt market, which might make it difficult for most Ghanaian banks to access long-term debt ([Gatsi et al., 2016](#)). Again the results indicates that the average capital adequacy ratio for the ten year period was 12% indicating that ton the average the CAR is above the required reserve ratio of 11%. The descriptive statistics above also show that the average poor provision in the banking sector of Ghana stood at approximately 5.65 with a standard deviation of about 0.57 percent which is considered to be on an extremely high note. This means that Ghanaian banks do not make adequate provisions to cover the loan portfolios, as recommended by earlier studies espoused in literature review. Another variable considered is Bank size which had an average of 7.88 percent, meaning that most of the banking institutions are large in terms of assets.

Table-2. Descriptive Statistics

Variables	N	Min	Max	Mean	Std. Dev	Skewness
NPL	200	0.81	12.86	8.13	4.95	2.86
LQ	200	0.80	1.74	1.43	12.65	2.64
CAR	200	0.11	0.16	0.12	0.04	4.76
PP	200	2.75	8.95	5.65	2.91	3.34
OS	200	0	1.00	1.00	0.57	2.72
WCMP	200	9.05	23.00	16.31	7.27	3.71
Bank Size	200	3.47	7.88	5.75	1.52	0.53
Loan Growth	200	-1.52	8.87	1.98	13.16	0.87

Constructed from the financial statements of the universal banks (2008-2017)

This value points out that there is rapid growth in the banking services industry in Ghana, and further revealed that the sector remains one of the most profitable industries in the Ghanaian economy (PwC., 2017). With regards to the other firm specific variables, working capital management practices and loan growth had the highest standard deviation of about 7.27 percent and 13.16 percent after revealing an average of about 16.31 and 1.98 percent respectively. The average indicators for these variables shows that the banks in Ghana have huge growth prospects more especially from the perspective of their bank specific variables such that they have enough funds to undertake any activity they so wish, to as well as having enough assets to sustain the operational activities of the company.

5.1. Correlation Analysis

The correlation matrix in Table 3 examines the possibility of multi-collinearity among the regressors as well as examine whether there is a positive relationship between dependent variables and the independent variables. This is important as it shows whether there is any relationship between the indicators of non-performing loan. From Table 3, it is observed that non-performing loan (NPL) is statistically significant negative relationship with all the indicators of bank specific factors which are poor provision (PP), ownership structure (OS) and working capital management practice (WCMP). This negative relationship between non-performing loan (NPL) and poor provision (PP), ownership structure (OS) and working capital management practice (WCMP), implies that when banks give more loans to their clients it leads to a reduction in their PP, OS and WCMP. The reason for this situation is because of the moral hazards of the banks which are exposed whenever they contract to give out loans to customers. This affirms the moral hazard theory espoused by Azofra and Santamaria (2011) in that the behaviour of one or both parties to the contract, or a risk to a financial institution resulting from uncertainty about the honesty of the insured or the borrower affects the agreement reached between the parties.

Table-3. Correlations Matrix of the Variables Used in the Study

	NPL	LQ	CAR	PP	OS	WCMP	BS	LG
NPL	1							
LQ	.645**	1						
CAR	.0519**	.022**	1					
PP	-.051*	.038*	.0410**	1				
OS	-.068*	-.024	.0147	-.268*	1			
WCMP	-.016*	.024*	-.0251	.814**	.135	1		
BS	.025*	.074*	-.0085	-.130	-.016	-.138	1	
LG	.041	.014	.0368	-.006	.056*	-.006	.129	1

Source: Financial Statement of Banks (2017)

The moral hazard problem implies that a borrower has the incentive to default unless there are consequences for his future applications for credit. Liquidity is significantly and positively related to poor provision while it is significantly and negatively related to ownership structure. This findings are in line with the studies of Greuning and Bratanovic (2010) because in both studies the measurement of liquidity and the bank specific variables were what was adopted in the current studies. Meaning that, irrespective of the area the studies are conducted when the measurement of the variables is the same, it is likely for the same result to be attained irrespective of the fact that it is conducted on different industries. In relation to interest rate Table 3 shows a statistically significant negative relationship with liquidity. Liquidity had a positive relationship with bank size, and Capital adequacy ratio and loan growth. In conclusion there seems to be a consistency in the results obtained for liquidity due to the linearity in the relationship between the bank specific variables measured.

5.2. The Hausman Specification Test

The Hausman specification test is a test that is carried out on a panel data prior to running a panel data regression to establish whether the researcher should choose the fixed effects or the random effects in the model estimation. The random effects model assumes that there is no correlation between the group specific random effects and the regressors. However, the fixed effects model does not make such assumption and the possibility remains that the assumption of zero correlation in random effects model is not feasible. As a rule of thumb, if the test is carried out and the probability value is less than 0.05 (i.e., $p < 0.05$) then there is a correlation between the error terms and the

explanatory variables so the fixed effects is adopted in the model estimation otherwise the random effects is an inefficient estimator of the parameters under investigation. Table 4 below shows the results of the Hausman specification tests, from the results, the test statistic originally developed by Hausman has an asymptotic χ^2 distribution. In testing the hypotheses the rule of thumb is that if the tests shows that the probability value is less than 0.05 (i.e. $p < 0.05$) then there is a correlation between the error components (defined as $e_{it} = u_i + e_{it}$) and the explanatory variables and the fixed effects is adopted in the model estimation; otherwise the random effects is a more efficient estimator of the parameters under investigation since it establishes that the u_i is random, independent of e_{it} and the explanatory variables.

5.3. Chi-Square Tests of Significance

The results of the χ^2 test of significance as estimated in this study are summarized in Table 4.

Table-4. Chi-Square Tests

Variables	Coefficients		(b B)	Sqrt (diag b-V_B))S.E.
	(B)Fe	(B)Re	Difference	
LQ	-0.046	-0.046	0.000	0.001
PP	-0.015	-0.015	0.000	0.001
CAR	0.056	0.401	0.000	0.001
WCMP	0.017	0.015	0.002	0.001
LG	0.057	0.057	-0.001	0.002
BS	0.402	0.405	-0.003	0.003
OS	-0.006	-0.006	0.000	0.000

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$\chi^2(6) = (b-B)[(V_b-V_B)^{-1}](b-B) = 0.91$

Prob>chi2 = 0.9888

Assuming $\alpha = 5\%$, the critical χ^2 values are 2.1797 and 17.5346. Since the computed χ^2 value of 0.91 lies between the limits, the data support the null hypothesis and we do not reject it. The conclusion of these tests is that *random effects* model was found to be appropriate for this study.

5.4. Effect of Non- performing loans on the liquidity of universal banks.

In this section, the various panel data regressions that were run are discussed. Regression analysis is used to investigate the relationship between non- performing loan and liquidity (LQ). As stated in the previous chapter, two major regressions were run in the study. However, to prevent multi-collinearity among the explanatory variables, a stepwise regression technique has been adopted so as to achieve a more efficient parameter estimates. From Table 5 the significant value shows that all factors appear significant except for working capital management practice and loan growth. Variables like bank size, non- performing loans, poor provision, loan growth and ownership structure product are all significant at 5 percent significance level. The effect of ownership structure and inflation is very strong such that a 1 percent decrease in these variables holding the other variables constant would increase the tendency of banks making an increase in their profitability by -2.467 percent and 5.251 percent respectively, which shows a strong compliance to empirical studies conducted by [Aker and Roy \(2017\)](#). This evidences a strong support for the adverse selection theory, where [Epure and Lafuente \(2015\)](#) postulate that adverse selection and moral hazard in consumer loan markets is likely to affect the ownership structure and the coefficient of other variables on its impact on liquidity. However [Zhang et al. \(2016\)](#) show that information sharing reduces adverse selection by improving banks information on credit worthiness of applicants. Out of the variables which were significant, bank size and inflation reflects strong positive association with liquidity (LQ) as evidenced by the coefficient of 0.909 and 5.576 respectively.

Table-5. Regression Result of LQ as Dependent Variables of the Banks

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	7.553	0.2741	4.2477	0.0001
NPL	0.039	0.1177	4.8950	0.0000
CAR	0.038	0.0183	2.0766	0.0393
PP	0.423	0.0085	2.5517	0.0123
WCMP	2.819	0.0079	1.5265	0.1319
LG	0.081	0.0147	0.8950	0.3743
BS	0.909	0.3190	2.0321	0.0230
OS	-2.467	0.8644	-4.2477	0.0001
R-squared	0.9213	Mean dependent var		1.7422
Adjusted R-squared	0.8789	S.D. dependent var		0.5731
S.E. of regression	0.1415	Akaike info criterion		-0.8857
F-statistic	66.232	Durbin-Watson stat		2.6536
Prob(F-statistic)	0.0000			

Source: Financial Statement of Banks (2017)

The results shows that an increase in the asset size which would reflect in the size of the banks would bring more than 0.909 percent increase in LQ. In addition, working capital management practice and loan growth does not influence liquidity significantly in the banking sector of Ghana as their respective p-value are not statistically significant. The evidence in Ghana is that, the working capitals of banks continue to decline on the books of most banks thus depriving management of funds to ensure the liquidity of the banks (PwC, 2017). Another reason for the insignificance of working capital management practice and loan growth in influencing liquidity is as a result of increasing costs in doing the business of banking in emerging economies including that of Ghana. The resultant effect of this is that it reduces profits which would have been retained to enhance the liquidity position of the banks in settling some of its current liabilities. These costs include increasing employee salaries, investments in information communication technology, acquisition and maintenance of chauffeured driven vehicles and air-conditioned premises, and finally increasing cost of raising deposits. These costs are discussed in turn.

The cost of hiring and maintaining employees continue to increase in the banking sector of Ghana. Global complexity of banking as a result of the advent of computer-based technology and increasing customer desire for ground-breaking products and services has called for the engagement of very skilled personnel for effective and efficient management of all these demands in order to remain profitable and competitive (PwC 2017). To achieve this, it is crucial for us to note that heavy costs are often incurred, which significantly reduces the wealth of the banks. The worst scenario is when the benefits of these employees do not achieve results which more than compensate significantly to the cost of hiring them. Furthermore, the cost of investment in information communication technology has also undoubtedly increased the cost of doing business in the banking sector of Ghana. For example, the cost of installing satellites, CCTV cameras, automated teller machines, telephone lines and other information technology devices have all escalated costs on the books of the various banking firms in Ghana. Consequently, this would affect banks' profits adversely and thus liquidity. What we must appreciate at this point is that more often than not, it is the net returns on loans given out by the banks that are primarily used in offsetting the above mentioned costs among other things (PwC., 2017).

It is therefore intuitive that if significant portions of this income are used in compensating for costs, then banking profits which is mainly a function of liquidity position will fall. Thus the insignificance of loan growth in determining liquidity in the banking sector of Ghana is not surprising. Another group of overheads, which is reducing banks' profit in Ghana and therefore shareholders' wealth thus making deposits insignificance in influencing returns on equity, is acquisition and maintenance of chauffeured driven vehicles and premises. In Ghana, most banking groups believe that one of the ways to attract clients is to operate from expensive, well decorated and well-furnished premises. This practice makes the banking halls attractive and comfortable to customers but would however lead to cost build ups, which if could be reduced would make banking firms more profitable and competitive in Ghana. Last but not least is the increasing cost of raising debt. There is an increased competition in the banking sector of Ghana due to global deregulation of the financial services sector and the gains that abounds in the banking industry in Ghana (PwC, 2017). This has led to the influx of many foreign banks mostly from Nigeria onto the soils of Ghana. To remain competitive and profitable therefore, banking firms in Ghana have embarked on aggressive advertisements and other forms of campaigns to increase their customer base. This adds extra cost to their operations.

From Table 5, Capital adequacy ratio (CAR) which was used as a proxy for minimum capital requirement indicated a positive relation with liquidity (LQ) of the banks. The coefficient of 0.038 and the p-value of 0,0393 attests the statistical significance of the relationship. Hence which an adequate capital or improved minimum capital requirement, the banks will improve their liquidity position basically because an increase in minimum capital means availability of more funds for operation if and only if these funds are not used for capital assets like more branches and ATMS. Furthermore, ownership structure (OS) was used as a control variable and thus the quest to see how it would influence return on equity. The results revealed that ownership structure (OS) enters the regression equation as negative with liquidity (LQ) and is statistically significant at a percent. This means that in the banking sector of Ghana, ownership structure (OS) is important in determining banks' liquidity. However, what is important for us to note is that as ownership structure (OS) increases bank performance measured as liquidity falls in Ghana and vice versa based on the evidenced revealed. The negative relationship between ownership structure (OS) and liquidity suggests that ownership structure (OS) tend to exhibit liquidity position and is consistent with models that emphasize the negative role of ownership structure (OS) from scale inefficiencies. This agrees with previous empirical works such as those of (Boudriga *et al.*, 2009; Mugwe and Oliweny, 2015).

6. Conclusion and Recommendation

This study was focused on examining the empirical relationship between banks liquidity and non-performing loans by discussing it in the context of minimum capital requirement. The study was conduct for a ten year period starting from 2008 to 2017. The choice of 2008 to 2017 was influence by establishing liquidity and NPL of banks post the 2008 financial crisis. The results of the study indicates that, NPL directly influence the liquidity position of the banks and that minimum capital requirement really matters when establishing the liquidity position of banks. It is therefore strongly recommended that banks will begin to demand some form of security even if not adequate to ensure that at least, it can recover part of the indebtedness in the event of default and that periodically relevant training programs are organized by the central banks to the managers of the universal banks on how to apportion their capital in other to have a balance of the funds in non-current asset and cash to avoid the negative effective on bank panic on their operation as well as maintaining the liquidity position of the banks.

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