A Re-Examination of the Remedial Action Adopted by the Central Bank during Banking Crisis – The Case of Ghana

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Abstract
It is generally accepted that the banking crises over the years have been caused mainly by financial institutions underestimating their common exposure to broad economic risks leading to inadequate equity capitalization and excessive investment in loans with unwarranted collateral valuations. The banking crisis in Ghana has become a central issue because it has come with a huge financial cost to the budget and reversed gains made in debt sustainability. As one of the early attempts to empirically examine the 2017-18 banking crisis in Ghana, this paper seeks to understand the causes of the crisis and also present an approach to dealing with a similar crisis in the future. A General Method of Moments (GMM) model was thus used to establish the relationship between the NPL ratio, the EMP index, and other bank-specific variables. The analysis also shows that the remedial actions adopted by the Bank of Ghana were not specified in any particular order as stipulated in section 102 of the Specialized Deposit-Taking Institutions Act of 2016 (Act 930). This study proposes a remedial measure that deals with the banking crisis in an orderly manner without any cost to the public purse.

Keywords
Banking crisis; Ghana; non-performing loans; bail-in; central bank.

Introduction

Ghana experienced an electricity power crisis and fiscal imbalances between the 2013 to 2015 period. This negative shock reduced the ability of firms to service their debts to banks. This reduction in debt service lowered bank equity and because of capital adequacy requirements, this, in turn, reduced bank lending and industry investment.

Before committing to an IMF Program in 2015, high cedi interest rates in the financial sector implied that many projects were inherently high risk. Forbearance had been used to delay capital provisioning requirements in some cases. These weaknesses were masked by varying practices in loan classification, provisioning, and loan restructuring, creating an optimistic picture of profitability (IMF, 2015). This is despite the views by Anisom-Yaansah, Oware, and Samanhyia (2016), and Ackah and Asiamah (2016) that a

highly competitive banking sector like that of Ghana was more efficient and thus is less likely to be financially distressed.

During 2017 and 2018, the BoG took a series of measures that led to the purchase and assumption of seven (7) banks, the voluntary winding down of one bank, the downgrade of one bank to a savings and loans company, the injection of equity into five (5) indigenous bank and the approval of three (3) mergers. These measures cost the public purse some GHc 16.4 billion – 5 percent of GDP – excluding interest payments on the bonds issued (BoG, 2019). These measures taken by the BoG had been tried in many countries that have also experienced a banking crisis in one form or the other. The difference, however, is the fact that Ghana did not appear to have the necessary regulation to help it tackle the problem effectively when it was discovered, compounded also by inadequate supervision.

This study, relying on and modifying the approach used by Makri, Tsagkanos, and Bellas (2014), sort to find out whether there were significant relationships between bank-specific factors, the exchange rate, and the NPL ratio over the period 2008 to 2019, and whether these could have explained the 2017-18 banking crisis. The study also seeks to establish whether the remedial measures taken by the BoG qualify as an effective way of dealing with the banking crisis.

The rest of the paper is structured into the literature review, which discusses the various theories underlying a banking crisis. This is followed by the data and methodology section which describes the methods used for the analysis. The results are then discussed to confirm the relationships between bank-specific variables and the NPL. Finally, the study makes conclusions and recommendations for future studies.

Literature review

Banks are presumed to know the creditworthiness of their borrowers better than anyone else. Deposits are redeemable at par and depositors also assume that they can get immediate access to liquidity – only if not everyone tries to withdraw funds simultaneously (Goldstein & Turner, 1996). As most bank products or services include a promise to pay in the future, it thus takes time for a bank's inability to fulfill its contracts to become evident. Banks can conceal problems by rolling over bad loans or by raising more deposits and increasing the size of their balance sheet (Caprio & Klingebiel, 1996). In the words of Demirgüç-Kunt and Detragiache (1998), "banks are financial intermediaries whose liabilities are mainly short-term deposits and whose assets are usually short-and-long-term loans to businesses and consumers. When the value of their assets falls short of the value of their liabilities banks are insolvent" (p. 84). One of the main tasks of a commercial bank is also to offer loans making credit risk their main source of risk i.e. the uncertainty associated with repayment of loans (Goldstein & Turner, 1996). Thus, the value of a bank's assets may drop because borrowers become unable or unwilling to service their debt leading to a crisis (Demirgüç-Kunt & Detragiache, 1998).

Davis and Karim (2008) defined a banking crisis as the occurrence of the severely impaired ability of banks to perform their intermediary role. According to them, the

collapse of a few banks constitutes a localized crisis whereas a collapse of the banking system constitutes a systematic crisis. A crisis also has significant direct and indirect costs. Bailouts cost on average 10% of GDP with some crises much costlier. For instance, the Mexican Tequila crisis in 1994 cost the government 20% of GDP whereas the crisis in Jamaica cost about 37% of GDP (Caprio & Klingebiel, 1996 cited by Davis & Karim, 2008; Hall, 2009).

Over the years, a vast majority of the banking crisis has been caused by financial institutions underestimating their common exposure to broad economic risks. The interest rate, credit, liquidity, and market risks-high non-performing loans – have been key determinants of banking crisis from the late-90s till date (Demirgüç-Kunt & Detragiache, 1998; Englund, 1999; David & Karim, 2008; O'Sullivan & Kennedy, 2010; Hoshi & Kashyap, 2010; Cox & Wang, 2014; Cleary & Hebb, 2016). These risks often resulted in loan losses dragging down profits and further reducing the equity cushion (Hoshi & Kashyap, 2010; Cox & Wang, 2014; Cleary & Hebb, 2016). According to Demirgüç-Kunt and Detragiache (1998), countries with an explicit deposit insurance scheme were particularly at risk as were countries with weak law enforcement. This necessitated the call for banks to increase their capital requirement and also an increased in fees charged for deposit insurance (Cleary & Hebb, 2016). Other studies have argued that a higher capital requirement will lead to banks taking more risks knowing that they have a 'backing' in a higher Capital Adequacy Ratio (CAR). However, this is the main reason why there is also the need for a higher CAR compared to not having it and being hit by a crisis. A higher CAR in the short term will hurt credit to the private sector, which in turn hurts economic growth. Higher CAR and prudent provisioning policy seem to reduce the level of problem loans (Obuobi et al. 2019). Ghana in the last eighteen years, has gone through three recapitalization programs – in 2007 banks were tasked to recapitalize to GH¢60 million, then in 2012 banks were directed to recapitalize up to GH¢120 million and in 2017 it was increased to GH¢400 million (Obuobi et al., 2019). Regulatory devices do not significantly reduce problem loans for countries with weak institutions and corrupt environments (Abou-El-Sood, 2016).

The effect of NPLs on the banking crisis

Another determinant of a banking crisis is increased credit risk or the probability that a borrower will default – converting an asset into a bad or non-performing loan (NPL). Usually, risk assessment by banks deteriorates during pre-crisis periods. Also, during these periods, asymmetry information does not restrict credit availability because bank managers succumb to the behavior of using biased information sets to make investment decisions. As a result, they ignore the potentially high default probabilities that could occur under recessionary states and underprice credit risk. Also, the high level of Non-Performing Assets (NPAs) taints the bank's portfolio but puts a burden on their income statements in the form of higher provisions which will lead to liquidity problems for many banks. A continuous increase in the NPL ratio can also lead to a credit crunch as witnessed in other countries in recent times (Adusei, 2018). These behavioral responses can be attributed to difficulties in measuring time series of credit risk and also to incentive-based managerial contracts which reward loan volumes (Davis & Karim, 2008).

According to Karim, Chan, and Hassan (2010), the NPL effect extends also to the macroeconomic environment (Ahmed, Takeda, & Thomas, 1999; Makri, Tsagkanos, & Bellas, 2014; Sosa-Padilla, 2018; Fofack, 2005; Mpofu & Nikolaidou, 2018). In Ghana, both bank-specific variables and macroeconomic variables have been found to significantly affect NPLs in the banking sector (Amuakwa–Mensah & Boakye–Adjei, 2015; Adusei, 2018).

The banking crisis and currency crisis – the twin crisis

Studies have also investigated the links between banking and currency crises (Gaies, Goutte, & Guesmi, 2018; Matsuoka, 2018; Peria & Domaç, 1999; Glick & Hutchison, 2000; Eichengreen & Hausmann, 1999; Kaminsky & Reinhart, 1999; Chang & Velasco, 2000). Kaminsky and Reinhart (1999) discovered that problems in the banking sector typically precede a currency crisis. Thus, the currency crisis deepens the banking crisis. Theoretically, the relationship between banking and currency crises runs from balance-of-payments problems. Chang and Velasco (2000), in studying financial fragility and exchange rate crises in Diamond Dybvig banks, discovered that a flexible exchange rate system implements the social optimum and eliminates bank runs, provided that the exchange rate and credit policies of the central bank are appropriately designed. Glick and Hutchison (2000), however, think that the openness of emerging markets to international capital flows combined with a liberalized financial structure makes them particularly vulnerable to twin crises. A situation like this according to them makes the banking crisis a leading indicator of a currency crisis in developing economies.

The banking crisis in Sub-Saharan Africa (SSA)

In SSA, 22 counties out of a possible 45 countries have experienced a banking crisis of one form or the other. On average these crises cost the public purse some 9 percent of GDP (for countries for which data is available) (Caprio & Klingebiel, 2002). The origin of the banking crisis in the SSA sub-region gained prominence in the 1985-95 period. Unlike other regions of the World, the crisis in SSA was first associated with heavy government intervention and loose controls on connected lending which hurt bank profitability and efficiency. This is despite the existence of the traditional causes – risk-taking and delays in taking corrective actions – of the banking crisis in the sub-region (Daumont, Le Gall, & Leroux, 2004). Ghana has not been spared in this regard. The country has experienced bank failures in one form or the other. Over the years before 2017, Bank for housing and construction, Meridian BIAO bank, Bank for Credit and Commerce International, Tana Rural Bank, Ghana Co-operative Bank, Tano Agya Rural Bank, the National Savings and Credit Bank, City Savings and Loans have all collapsed (Anisom-Yaansah, Oware, & Samanhyia, 2016). A critical look at the crisis in the sub-region will however show that high NPLs proceeded the crisis periods leading to bank insolvency (Caprio & Klingebiel, 2002). Ackah and Asiamah (2016), points to the continued depreciation of the Ghanaian currency (Ghana Cedi) and the high non-performing loans as one of the major risk to the banking sector in Ghana.

Dealing with the banking crisis

Despite extensive literature on the causes and prediction of a banking crisis by early warning systems, their practical use by policymakers is limited. According to Davis and Karim (2008), this is a paradox because as more economies liberalize and develop their financial systems, the nature of banking risks also changes making the use of early warning systems for crisis prevention more necessary than ever. The most common approach by policymakers in dealing with banking crisis has been to set a minimum ratio target which usually is an increase from what used to exist – as was in Ghana and the US example explained above. Minimum equity or capital ratio requirements promote bank stability but Aiyar, Calomiris, and Wieladek (2015) suggest compliance must be measured credibly and that these requirements must be commensurate with risk. A mix of higher book equity requirements, a carefully designed contingent capital requirement, cash reserve requirements, and other measures, would address objectives better than book equity requirements alone. They criticized Basel III's defined liquidity ratios. They also contend that raising minimum capital requirements will not be socially costless; bank profitability, share prices, and loan supply are likely to suffer (Aiyar, Calomiris, & Wieladek, 2015). The bone of contention here is that regulators face a trade-off between high capital requirements which impacts bank profitability and strict supervision which is costly to the taxpayers either directly or indirectly (Buck & Schliephake, 2013). Buck and Schliephake (2013) propose an effective combination of both in dealing with the banking crisis.

In some instances, governments are required to bail out failing banks. They do this because letting the banks fail and enter insolvency would have caused excessive disruption to the critical services that these institutions provide and to the wider financial system. Bailing out banks is costly and also likely to undermine the incentives for firms to be run prudently and for investors to monitor the activities of the firm to prevent excessive risk-taking from jeopardizing their investment. Even when bailouts are carefully designed, they are often very costly for the fiscal budget, they may allow inefficient banks to remain in business and they are likely to create the expectation of future bailouts, thereby reducing incentives for adequate risk management by banks. It may also weaken managerial incentives by forcing healthy banks to bear the losses of ailing institutions. An attempt to deal with the problem with a loose monetary policy can be inflationary leading to a speculative attack on the domestic currency when the country is not implementing a flexible exchange rate regime (Demirgüç-Kunt & Detragiache, 1998).

According to Chennells and Wingfield (2015), a key attribute of an effective bank resolution regime is to ensure that banks could fail without disrupting the financial system, without interrupting the critical services they provide, and importantly without requiring public sector support. One way of ensuring this is through a "bail-in" – part of a set of principles for managing the failure of systemically important financial institutions developed by the Financial Stability Board of the UK. By this, the claim of shareholders and unsecured creditors of the failed bank are written down and or converted into equity to absorb the losses and recapitalize the bank or its successor. It is not negotiated; it is imposed on the bank and its creditors by the authorities responsible for resolution. However, in a developing country setting, this solution will

be difficult to implement considering corruption and weak law enforcement (Demirgüç-Kunt & Detragiache, 1998). This and other reasons make the situation in developing countries very unique. In SSA like any other developing region in the World, the procedure for recovering loans is lengthy and cumbersome. The time it takes for procedures to be initiated and the time a decision will be given by the courts could span more than a year. In situations where the court orders are given in favor of a creditor, lawyers among others delay the execution of the judgment by feeling appeals that have no real grounds (Daumont, Le Gall, & Leroux, 2004). The literature on Ghana and SSA at large is limited and even so most of the studies were short of proposing remedial measures that deal with the problem holistically.

In other to bridge the gap in the literature enumerated above, this study will examine the banking crisis in Ghana because of how recent it is and also its uniqueness in terms of the remedial actions taken to deal with the problem. Among other things this study will try to identify if the crisis in Ghana could have been detected earlier than 2017 and also by adopting the solution proffered by Chennells and Wingfield (2015), one will suggest solutions to a future banking crisis in developing economies using Ghana as a case study. This will also be one of the first attempts to empirically examine the 2017-18 banking crisis in Ghana.

Data and methodology

Data

Bearing in mind that the banking sector was characterized by understated exposures and the use of suspicious and non-existent capital, this study is mindful of the accuracy of the data been employed. The data used were sourced from both local (BoG) and international (IMFs Financial Soundness Indicators, 2019) secondary sources. This was done to verify and ensure that the data used are accurate and consistent. The study period spans the 2008Q1 to 2019Q2. The data represents data for the banking sector as a whole and is not broken down into individual banks as used in other studies. The sample period represents periods for which data was available in the IMF's Financial Soundness Indicator's database.

The crisis in Ghana is a systematic crisis

It has however been argued that the situation in Ghana does not constitute a banking crisis. Before delving into the methodology to be employed by this study, we try to establish whether the situation in Ghana constitutes a banking crisis or not. Demirgüç-Kunt and Detragiache (1998) established somewhat-arbitrary that for an episode of distress to be classified as a fully-fledged crisis, at least one of the following four conditions has to hold: the NPL to total assets in the banking system exceeds 10 percent; the cost of rescue was at least 2 percent of GDP; the banking sector problems resulted in a large scale nationalization of banks; extensive bank runs took place or emergency measures such as deposit freezes, prolonged bank holidays or generalized deposit guarantees were enacted by the government in response to the crisis.

In the case of Ghana, the NPL to total assets ratio did not exceed 10 percent. Over the period 2008 to 2017, it hovered around 9 percent even though it exceeded 10 percent in the second quarter of 2010 and also in the third quarter of 2016. As of end-2017, the ratio stood at 9.20 percent. The cost of cleaning the banking sector is expected to have been 3.3 percent of GDP as of end-2018. By the end of 2019, is expected to increase by an additional 1.6 percent of GDP (IMF, 2019). By end-2018 six banks were nationalized through the creation of the Consolidated Bank Ghana (CBG) Limited through a purchase and assumption agreement. These reforms were made possible after the passage of the Banks and Specialized Deposit-Taking Institutions Bill and the Deposit Protection Bill in June 2016. The two Bills strengthened the BoG's ability to safeguard financial stability, through enhanced powers to resolve banks that are deemed to be unviable and a new deposit insurance scheme that will protect small depositors in the event of resolution. Judging by the Demirgüç-Kunt and Detragiache (1998) criteria, one can possibly confirm that the situation in Ghana between 2015 and 2018 can be considered a fully-fledged banking crisis. This is because all the conditions except the condition on the NPL to total assets existed in the Ghanaian situation. According to Demirgüç-Kunt and Detragiache (1998), the occurrence of even one of the criteria is enough to assume the presence of a crisis situation.

The determinants of the banking crisis in Ghana using the GMM model

The literature reviewed showed that banking crises usually occur due to a deterioration of bank asset quality. However, the notion that a crisis can occur on the liability side cannot also be overlooked. In this case, changes in asset prices or a large increase in non-performing loans (NPLs) could be used to mark the onset of the crisis. Using a variation of the model specified by Makri, Tsagkanos, and Bellas (2014), this study will determine how the NPL determines bank-specific factors in Ghana.

$$NPL_t = \alpha_0 + \beta_1 X_t + \varepsilon_t \qquad (1)$$

The NPL_t is the Non-performing Loans to Total Gross Loans, X_{it} denotes bank-specific variables shown in table 1 below. In extending the analysis a lag of the dependent variable was added to the equation above to capture the dynamics of these variables over the previous years. This is shown in the equation below:

$$NPL_t = \alpha_0 + \beta_0 NPL_{t-1} + \beta_1 X_t + \varepsilon_{it} \qquad (2)$$

To be sure of the appropriate EMP index for Ghana, we construct six different versions of the EMP index based on the index proposed by Girton and Roper (1977) and then regress these variations of the index on the log changes of the exchange rate variable in Ghana. For both the OLS model and the Ridge Regression used, the EMP index similar to the one proposed by Girton and Roper (1977) – EMP_2 – followed by the recent variation of the index – EMP_1 – had the most response to changes in the exchange rate variable.

Considering that Ghana has adopted the IT framework for a monetary policy we adopt the variation of the index that captures the reaction function of the monetary

authorities – EMP_1. The index constructed is similar to the original index estimated by Hegerty (2018), which was based on Eichengreen et al. (1994, 1996).

Table 1. Bank specific variables

Variable	Interpretation	Apriori Sign
EMP	Exchange Market Pressure Index	-
GLCD	Gross Loans to Customer Deposit	+
FCDLTG	Foreign-Currency-Denominated Loans to Total Gross Loans	+/-
ROA	Return on Assets	-
ROE	Return on Equity	-

Authors' construction

The model specified by Makri, Tsagkanos, and Bellas (2014) in some other terms can be seen as trying to identify determinants on the NPL. This is somewhat contrary to the view that the NPL and other bank-specific variables determine either the ROE or the ROA. To prevent any doubt, we estimate another equation that uses the ROE and ROA as dependent variables and maintains the other bank-specific variables as explanatory variables as shown below.

$$ROE_t = \alpha_0 + \beta_1 X_t + \varepsilon_{it} \qquad (3)$$
$$ROA_t = \alpha_0 + \beta_1 X_t + \varepsilon_{it} \qquad (4)$$

From the literature discussed above, it is clear that high NPLs erode bank capital constraining growth and innovation in the banking sector. They also affect the cost efficiency of banks. Since bank asset quality and operating performance are positively related, inadequate asset quality will also mean an increase in its bad debt loss as well as banks spend more resources on the collection of NPLs. Therefore, the efficiency of the banking sector can somehow be measured by the level of NPLs in the sector as bad management in the sector leads to lower credit ratings for approved loans and a high probability of default resulting in higher non-performing loans (Karim, Chan, & Hassan, 2010).

This study like Makri, Tsagkanos and Bellas (2014) employs the Generalized Method of Moments (GMM). This is because an OLS estimation showed signs of serial correlation between the variables and the error term. Also, the lag of the dependent variable is included as a regressor – in the case of equation 2 – which violates the exogeneity assumption for regressors so a more sophisticated and dynamic econometric technique is required to produce unbiased estimators. To deal with this situation the equation is estimated using instrument variables regressions. Thus, finding a set of variables that are both correlated with the explanatory variables in the equation, and uncorrelated with the error term. These will be used to eliminate the correlation between the variables and the disturbances. The GMM is just one of the approaches used to deal with the effect of variable and residual correlation. The moment condition can be written as:

$$E\big(m(y_t, \beta)\big) = 0 \qquad (5)$$

The assumption here is that there are a set of L moment conditions that the K dimensional parameters of interest, should satisfy. Equation 5 represents also the vector of $L \geq K$ moment conditions.

Relying on moment conditions expressed as an orthogonality condition between the residuals of the equation to be estimated, $\mu_t(\beta) = \mu(y_t, X_t, \beta)$ and a set of K instruments Z_t, equation 5 becomes:

$$E\big(Z_t U_t(\beta)\big) = 0 \qquad\qquad (6)$$

The traditional Method of Moments estimator is defined by replacing the moment conditions in Equation 5 with their sample analog shown in equation 7 below.

$$m_T(\beta) = \frac{1}{T}\sum_T Z_t U_t(\beta) = \frac{1}{T} Z' \mu(\beta) = 0 \qquad (7)$$

The Eviews software is used by this study to find the parameter vector β which solves the set of L equations. When there are more moment conditions than parameters $L > K$, the system of equations given in Equation 5 may not have an exact solution. Such as system is said to be overidentified. The Generalized Method of Moments estimate is defined as the β so that the sample moment $m_T(\beta)$ is as "close" to zero as possible. The weighting matrix for the model was the HAC - Newey-West weighting matrix. This weighting matrix deals with heteroskedasticity and autocorrelation problems which is consistent with the long-run covariance matrix of $Z_t U_t(\beta)$ based on an initial estimate of β (Hansen et. al., 2008). A unit root test (Augmented Dickey-Fuller Test Equation) conducted was not significant for all variables. Therefore, the null hypothesis that the variables had a unit root was not rejected – this was not the case when the test was conducted at level. The EMP index used did not have a unit root as expected.

Results and discussions

As shown in Appendix table 1, the results for equation 3 show that the NPL, the EMP, and the FCDLTGL were significant in explaining the ROE. The negative sign of the NPL confirms the theory that high NPLs lead to the erosion of profits in the sector. Also, the negative sign of the EMP index will also mean that depreciation of the domestic currency also affects bank profit consistent with the literature. For equation 4 only the GLCD and the FCDLTGL were significant in explaining the ROA. They both had the right signs as an increase in these indicators – all things being equal – will lead to an increase in the profit indicator (ROA and ROE).

The results of the GMM regression for equation 2 showed that the NPL has a significant negative relationship with the EMP index and the ROE confirming the apriori signs. The NPL on the other hand had a positive relationship with its own lag (NPL (-1)), the ROA, and the GLCD. The relationship between the NPL and the FCDLTGL was not significant over the study period. The GMM model used in this study is a good model as the R-squared and Adjusted R-squared are all appropriate. The Sargan statistic – J-statistic – is not significant for all equations so the null hypothesis that the over-

identifying restrictions are valid is accepted. There were as many instruments as there are parameters in the model. The instrument rank (7) is also greater than the number of estimated coefficients confirming the value of the J-statistic. This is a key criterion in assessing the appropriateness of a GMM model (see Table 1).

Table 2. GMM Regression result – Dependent variable is the NPL

Variable	Coefficient
NPL(-1)	0.8692
	(25.4253)*
EMP_1	-0.3064
	(-2.1167)**
ROA	0.5564
	(2.4299)*
ROE	-0.1533
	(-3.6284)*
GLCD	0.0611
	(4.6782)*
FCDLTGL	-0.0271
	(-0.5429)
R-squared	0.9329
Adjusted R-squared	0.9243
Durbin-Watson stat	1.8074
Instrument rank	7
J-statistic	0.0070
Prob(J-statistic)	0.9331

NB: *For GMM, t-statistics is in parenthesis (). Symbols *, **, *** indicates statistical significance at 1%, 5% and 10%*
Authors' construction

The results suggest that the high NPL ratios in Ghana affected bank profit negatively through their Return on Equity (ROE) during the study period (crisis period). This finding is consistent with the findings of Cox and Wang (2014), and Cleary and Hebb (2016). As discussed earlier, the ROE is a measure of shareholders' returns and the potential growth of their investment. This is because shareholder's equity can be seen as a company's assets less its debt. It was thus of no surprise that some of the banks were found to have obtained their licenses under pretenses through the use of suspicious and non-existence capital. Resulting in a situation where their reported capital was un-accessible to them for their operations (BoG, 2019).

This could explain the unexpected positive relationship between the ROA and the NPL. Banks hold capital to prevent bank failure and meet bank capital requirements set by the regulatory authorities. The fall in the ROE over the study period (see Figure 1) made it difficult for banks in Ghana to handle the crisis as it unfolded even though the regulatory capital requirement was increased at end-2018. The previous year's NPL also influenced the current period's NPL during the study period – thus an unresolved NPL problem compounds the NPL problem in the current period. It is also an indication of delays by banks to deal with the increasing NPL ratio over the study period. Over the study period also Gross Loans to Customer Deposits (GLCD) increased significantly as NPLs increased. This ratio hovered around 77 percent between 2013 to

2015. It is however of no coincidence that there was significant pressure on the Ghanaian currency before the increase in the NPL and the fall in the ROE in 2015. This is confirmed by the significant relationship between the EMP variable and the NPL ratio. The negative relationship means that depreciation pressures affect the NPL ratio. The depreciation of the currency in 2014 was the highest over the study period especially in the first quarter of 2014. The increasing NPL meant bank capital and profit where been eroded as Gross Loans to Customer Deposits (GLCD) continue to hover around 70 percent until the first quarter of 2018. One would have expected the banks to have reduced their exposure as NPLs continued to rise.
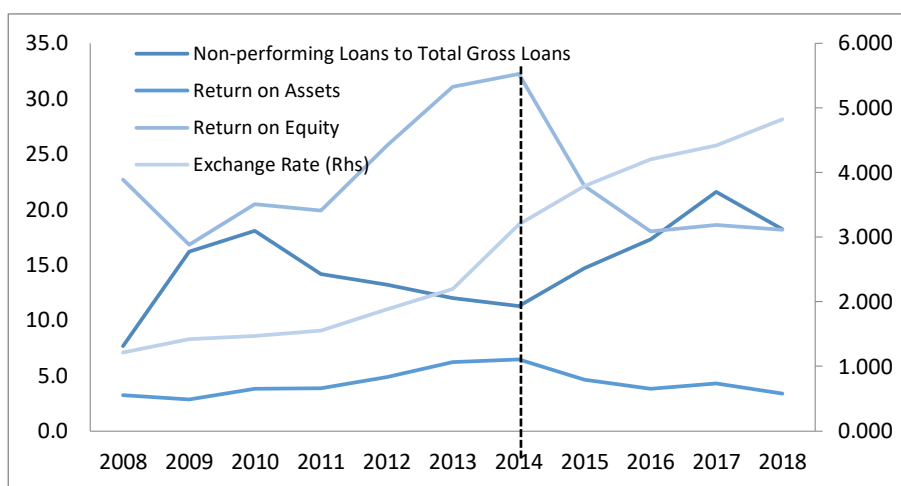

Figure 1. Bank specific factors – 2008 to 2018
(IMF Financial Soundness Indicators, 2020)

It is thus clear also that aside from the NPL problem there were also significant problems with bank supervision. This was perverse as some of the banks even after receiving substantial liquidity support (over GHc 2.2 billion) from the BoG, to meet its recurring liabilities, still continued to grant new loans and incurred new capital expenditures when the law does not allow them to consider their state. Also, a key shareholder of one of the troubled banks managed to obtain liquidity support from the BoG using third-party banks as its agents making BoG's exposure to the bank underestimated (BoG, 2019).

In dealing with the crisis, the BoG employed a lot of tools which in the end cost the public some GHc 16.4 billion – 5 percent of GDP – from 2017 to 2019. This figure excludes interest payments on the bonds issued (MoFEP, 2019). The IMF puts this figure at GHc 15.8 billion equivalent also to 5 percent of GDP. The resolution tools – traditional and non-traditional – included purchase and assumption by existing banks and the setting up of a bridge bank, increase in minimum paid-up capital in the banking sector from GHc 120 million to GHc 400 million by end-2018 and the injection of capital in five indigenous banks from private pension funds in Ghana through a special purpose holding company called the Ghana Amalgamated Trust (GAT) Limited. These measures were attempts by the government and the BoG to save depositors and investors whose funds were locked up with the failed financial institutions. Thus,

authorities needed to intervene to limit the disruption from failing banks and other financial institutions – most of which included the use of public funds to safeguard the deposits held by universal banks that were resolved by the Bank of Ghana, and to set up the bridge bank, Consolidated Bank Ghana (CBG) Limited, mentioned earlier. Aside from the financial cost of these interventions, the effect on government debt could not also be overlooked.

Bailouts without direct consequence on handlers of financial institutions or banks are likely to lead to moral hazards in the banking sector. The managers and owners received the benefit of profits earned from banking activities carried out in the run-up to the crisis but when the crisis occurred losses were mostly shared by the public sector rather than being absorbed entirely by owners and unsecured creditors of the banks. Thus, these owners are protected from some or all of the adverse consequences. The Banks and Specialized Deposit-Taking Institutions Act, 2016 (Act 930) as discussed above has made it possible for remedial measures to be taken if risks including crisis occur in the banking sector. This Act through appropriate does not put the remedial actions as remunerated in section 102 of the Act, in any particular order. It gives the authority to the BoG to use its discretion to decide on which of the remedial actions to use at any particular time. This is contrary to an alternative position by Chennells and Wingfield (2015) which advocates for the management of such crisis in an orderly manner including preserving financial stability, ensuring the continuity of critical economic functions, and protecting depositors and public funds. The resolution measures adopted by the Ghanaian authorities met all but failed in protecting public funds. The 'stabilization' in the sector could have been achieved through a bail-in that restructures the capital position of the failing bank – similar to what the Ghanaian authorities are implementing (open bank bail-in) through the establishment of the bridge bank (CBG). Unlike the open bank bail-in, a closed bank bail-in ensures that the liabilities that are to be absorbed remain in the original bank that is put into an insolvency process while the good assets are transferred to a newly created entity.
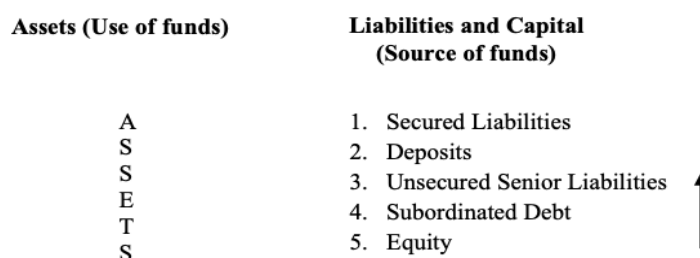
Assets (Use of funds)   **Liabilities and Capital**
                                   (Source of funds)

A   1. Secured Liabilities
S   2. Deposits
S   3. Unsecured Senior Liabilities
E   4. Subordinated Debt
T   5. Equity
S

Figure 2. The structure of a bail-in
(Chennells and Wingfield, 2015)

In a bail-in, the claims of shareholders and unsecured creditors are written down and/or converted to equity to absorb the losses of the failed bank and recapitalize its successor. It does not depend on the authorities finding a willing and able purchaser for all or part of the bank in a short period of time.

The bank's assets include loans that it has made to households and businesses, lending to other financial institutions, and holding of securities such as government and

corporate bonds and its holding of cash. The bank's liabilities are what it owes to others. They include funds that the bank has borrowed in the form of issuing debt – bonds. In Figure 2 above, the liabilities have been arranged in order of seniority in the hierarchy of creditors, with the most senior liabilities at the top and the most junior, which are first to absorb losses, at the bottom. Those liabilities that have been secured against assets on the other side of the balance sheet are liabilities considered senior – cash deposits and high-quality debt. Equity, which is full loss-absorbing, is the banks' capital.

It may happen that the original shareholders may not have been wiped out completely but their interest in the banks to be bailed-in will be severely diluted. In this regard, those next in the liability hierarchy from the bottom as shown in figure 2, will be converted to equity to replenish the low or non-existent capital.

Conclusions

It is thus evident that the happenings in the banking and financial sector of Ghana constitute a crisis, judging from the criteria proposed by Demirgüç-Kunt and Detragiache (1998). The sector as discussed, experienced both a fall in ROA and ROE as NPLs increased. This was also after there was a sharp depreciation in the domestic currency in periods before the crisis (2015-2017). Even though the IMF warned of the crisis in 2015, it took a year for the accompanying regulatory reforms to be passed paving the way for the intervention in 2017. The GMM model estimated showed significant relationships between NPLs in Ghana, exchange market pressure, ROE, and the gross loan to customer deficit, over the period 2008 to 2019. This means that an increase in NPLs eats into the return on shareholder's investment thereby affecting the capital base of banks in the sector. The high NPLs will mean that the credit-worthiness of borrowers is not entirely assured before the granting of loans. As NPLs increased over the period, one would have expected regulators to have moved in to prevent or reduce the deterioration in bank equity or assets.

The remedial actions taken by the BoG as indicated in this study, are very costly to the country which has just exited an IMF program and has reversed some gains made on debt sustainability. This is contrary to the alternative where an effective bank resolution regime would have ensured that banks could fail without disrupting the financial system, without interrupting the critical services they provide, and importantly without requiring public sector support (Chennells & Wingfield, 2015). This study also found that the remedial measures stipulated in the Specialized Deposit-Taking Institutions Act, 2016 (Act 930) are not in any particular order – specifically section 102 of the Act. This study proposes a remedial measure similar to the one proposed by Chennells and Wingfield (2015) – the bail-in. The key feature of this measure is that the restructuring of the failing bank is done in an orderly conversion of liabilities into equities to replenish the low or non-existent capital. The liabilities are arranged in order of seniority with the owners' equity being the most junior of the liabilities.

For this measure to work effectively, there must be loss-absorbing capacity in the right amounts, right form, and right place within the banking sector. In other words, there

must be something for the resolution authority to bail in. Bearing in mind that this was a contributory factor to the crisis in Ghana – banks under-stating their capital and reporting non-existent capital – one recommends an effective and efficient supervisory arm of the BoG. This will ensure that bank capital, as reported, is available in line with the Bank of Ghana Act 2002, Act 612, Bank of Ghana (Amendment) Act, 2016 (Act 918), and the Banks and Specialized Deposit-Taking Institutions Act, 2016 (Act 930). This will ensure that there are liabilities on the balance sheet that can be written down or converted into equity without disrupting the day-to-day functioning of the financial sector. Effective supervision of the sector will make the implementation of these proposals somewhat successful.

The only caveat is that if a bail-in occurs with one bank then the other banks holding the failing bank's debt could experience losses. However, if the size of a bank's holding of other banks' debt is limited by regulation then this will not be an issue. This study proposes for this to be included in the proposed amendment of the Banks and Specialized Deposit-Taking Institutions Act, 2016 (Act 930).

Relying on voluntary efforts from banks to resolve NPLs may not be sufficient even when NPLs are recognized. Creating a good legal framework for Bank restructuring and timely disposal of NPLs is crucial, in particular when the judicial capacity to deal with NPLs is lacking.

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Appendix

Appendix Table 1. GMM model for the ROE and ROA – Dependent variable is the NPL

Variables	ROE	ROA
C	2.9044	-7.0784
	(0.2058)	(-2.7006)
NPL	-0.9143	0.0440
	(-2.6915)**	(0.6640)
EMP_1	-1.1428	-0.0415

	(-2.0567)**	(-0.3019)
GLCD	0.0953	0.0387
	(0.8825)	(1.7452)***
FCDLTGL	1.0316	0.2905
	(5.1123)*	(8.3392)*
R-squared	0.5211	0.6099
Adjusted R-squared	0.4707	0.5689
Instrument rank	7	7
J-statistic	1.9882	3.6434
Prob(J-statistic)	0.3701	0.1618

NB: For GMM, t-statistics is in parenthesis (). Symbols *, **, *** indicates statistical significance at 1%, 5% and 10%
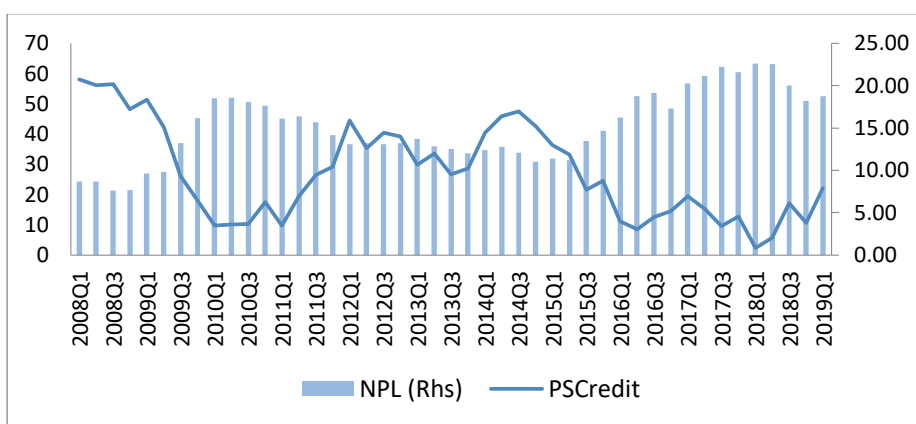*Authors' construction*

Figure 2. NPL and Private Sector Credit Growth – 2008Q1 to 2019Q1
(IMF Financial Soundness Indicators, 2020)