

Non-performing loans and banking laws amongst commercial banks during dollarisation era in Zimbabwe: A time series econometric assessment

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Abstract

This study examined the impact of Capital Adequacy Ratio on Non-Performing Loans amongst the Commercial Banks in Zimbabwe during the dollarisation era. The data covered period 2008-2017. In this study, we used the Ordinary Least Squares to estimate the regression equation. After all necessary statistical tests were undertaken, diagnostic tests were done to determine if the model is reasonably well specified. The estimation results revealed that there is a significant inverse relationship between Capital Adequacy Ratio and Non-Performing Loans. There is, therefore, need for the introduction of higher minimum bank capital requirements which may well induce slowdown or contraction of bank lending in Zimbabwe. The enforcement of capital adequacy requirements would significantly curtail credit supply.

Keywords: non-performing loans, capital adequacy ratio, basel capital accords, minimum capital requirements

1. Introduction

A banking industry that is sound, is essential to the growth of any economy, with the soundness measured in terms of Capital Adequacy Ratio (CAR). It is, the pursuit of every country, to ensure that its banking industry is financially sound all the time. Countries, therefore, promulgate regulation to govern how banks should effectively and efficiently perform. However, despite the well thought enacted laws governing banks, there has been an upsurge of non-performing loans across the commercial banks of Zimbabwe. These non-performing loans (NPL) are being characterised of impacting negatively on the soundness of banks. This study, therefore, determines the relationship between non-performing loans (NPL) and Capital Adequacy Ratio (CAR) among Commercial banks in Zimbabwe for the post-dollarisation epoch.

2. Background to the Problem of the Study

Capital requirements play a key role in the supervision and regulation of banks. Policy makers have put in considerable effort to design bank capital regulation as a way of safeguarding overall financial stability. In Zimbabwe, the Basel Capital Accord was issued in 1988 and market risk was dealt with in 1996 and the Basel II Accord was issued in 2004. Accompanying the policy effort has been the adoption of the Basel capital standards. The main objectives of the Basel Committee on Banking Supervision (BCBS) were to encourage international banks to boost capital positions and to reduce competitive inequalities. According to the BCBS, banks were required to maintain a capital adequacy ratio of 8% measured as net capital divided by total risk weighted assets. In line with this, the Reserve Bank of Zimbabwe (RBZ) adopted formalised capital requirements for banking institutions in 1996. The Reserve Bank of Zimbabwe pegged the minimum capital adequacy ratio at 10%. In addition to the BCBS capital requirements, banking institutions were also required to maintain a minimum level of core capital in accordance with the

requirements of the Zimbabwean Banking Act (Chapter 20:24). The Reserve Bank of Zimbabwe has been constantly changing the minimum capital requirements for banks with the last review being United States dollar linked capital requirements. A number of developing countries have adopted the Basel Capital Standards with direct consequences on the banks behaviour and the macro-economy. However, there are concerns that this unduly increases volatility in the banks' capital. Many authors have tried to assess empirically the impact of capital requirements on banks' behaviour. Most studies concentrate on developed countries and empirical evidence has remained scarce on developing countries and Zimbabwe in particular. It is against this background that this paper provides empirical evidence on the impact of capital adequacy ratio (CAR) on non-performing loans (NPLs) in Zimbabwe from 2009 to 2015.

Zimbabwe adopted a multiple currency regime in 2009 (Reserve Bank of Zimbabwe, 2010). A multiple currency system allowed trade to be conducted using major trading currencies, for example, the United States Dollar (USD), British Pound (GBP), South African Rand (ZAR), and the Botswana Pula (BWP). After the adoption of the multiple currency system, the banking sector experienced marked improvements in the intermediary role which resulted in improved financial support to the key productive sectors of the economy (Reserve Bank of Zimbabwe, 2010). A research conducted by the International Monetary Fund in 2010, indicated that the profitability of banks had improved following a more favourable economic environment during the new regime. While officially reported, aggregate banking soundness indicators do not raise major red flags, they mask vulnerabilities specific to a fully dollarized banking system experiencing rapid credit growth, as well as a significant variation in prudential indicators across individual banks. The Reserve Bank of Zimbabwe (2016) also noted that there has been gradual deterioration in asset quality as reflected by the level of non-performing loans

(NPLs) trending towards the watch list category. The implication being that borrowers are struggling to repay loans leading to the problem of banks sitting on NPLs (see figure 1 below).

Rather, NPLs in the financial sector are viewed as an obverse mirror image of an ailing unprofitable enterprise (Chikoko, Mutambanadzo, Vhimisai, 2012) ^[8]. From this point of view, the eradication of non-performing loans is a necessary condition to improve the economic status of the financial institution. Continuously rolling over NPLs locks up resources that could otherwise be invested to profitable sectors of the economy. Intuitively, this hinders economic growth and impairs economic efficiency. In fact, a competent and developed banking industry is very fundamental to the growth of any economy. The determinants for loan default vary in different countries and have a multidimensional feature both at matured and emerging economies. In Zimbabwe NPLs can be best explained by high lending rates, poor corporate governance, approval of loans based on balance sheet strength, insider and related-party lending practice, information asymmetry, and excessive growth of the credit book as well as weak supervision by the Reserve Bank of Zimbabwe (Hamandishe and Vhimisai, 2013). The concept of NPLs has been defined in different literatures, (Chikoko, Mutambanadzo, Vhimisai, 2012; Kavwanyiri, Mutua and Abraham, 2017) ^[8]. According to the International Monetary Fund IMF (2010) non-performing loan is any credit in which interest and principal operating expense are more than 90 days long-ago. Non-performing loans are therefore, loans that are ninety or more days' delinquent in payments of interest and/or principal (Bexley and Nenninger, 2012). The following figure depicts the trajectory followed by the two variables CAR and NPLs.

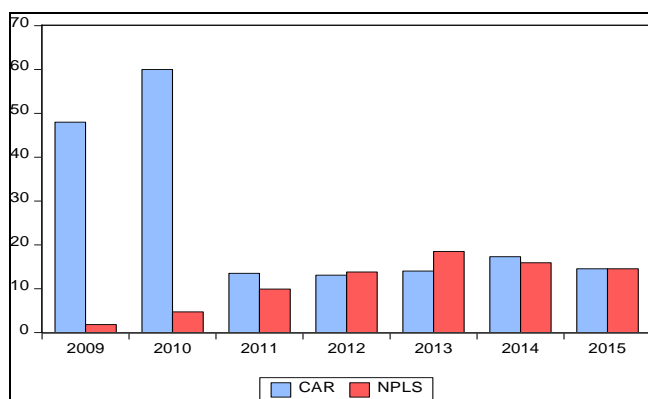


Fig 1: Capital Adequacy Ratio (CAR) and Non-performing loans (NPLs): Adapted from Reserve Bank of Zimbabwe (2016).

The two variables depicted in figure 1 above, seem to be exhibiting a stochastic and positive relationship. This study, seeks to determine the impact of CAR on NPLs during the dollarised era among the Commercial Banks in Zimbabwe. The ultimate objective is to draw lessons from commercial banks' lending in Zimbabwe during the dollarised period. The paper is organised as follows. In the second section, we present the research objectives and hypothesis of the study. In the third section we present the review of related literature, followed by materials and methods, that is, the research methodology; in the fourth section. In the fourth section, a discussion of the findings is undertaken and finally, conclusions and recommendations are presented.

3. Statement of the Problem

Despite the well thought enacted laws governing banks, there has been an upsurge of non-performing loans across the commercial banks of Zimbabwe. These non-performing loans (NPL) are being characterised of impacting negatively on the soundness of banks. This study, therefore, determines the relationship between non-performing loans (NPL) and Capital Adequacy Ratio (CAR) among Commercial banks in Zimbabwe for the post-dollarisation epoch.

4. Research Objectives and Hypothesis

The objective of this study is to determine the impact of Capital Adequacy Ratio (CAR) on Non-performing loans (NPLs) in Zimbabwe. It also seeks to make recommendations that would assist policy makers in enhancing the soundness of financial institutions in Zimbabwe. The hypothesis that pinned this study is that high Capital Adequacy Ratio (CAR) is negatively related to Non-performing loans (NPLs).

5. Review of Related literature

Capital is defined as the cushion that protects banks and their customers and shareholders against loss resulting from the assumption of risk as shown by Basel Committee on Banking Supervision (2008). Adequate capital supports future growth, fosters public confidence in the bank's condition, provides the capacity under the bank's legal lending limit to serve customers' needs, and protects the bank from unexpected losses (Furlong, 2008) ^[12]. The primary aim of Capital Adequacy requirements is therefore to limit risk-taking by banking institutions (Chikoko and Pierre Le Roux, 2013) ^[7]. Furthermore, the capital adequacy ratio can also assist regulators to define the threshold at which to intervene in the management of the failing bank. Since shareholders' payoff function is convex with respect to the bank's net worth, their incentive to take risks increases as its net worth declines. Although this would hurt the interests of the bank's depositors, they may fail to intervene if they are too small and uninformed about the bank's management. In view of this, capital adequacy regulation is necessary to protect the depositors against shareholder moral hazard.

It is optimal to transfer the bank's control rights from its shareholders to the regulator who represent the interests of the bank's depositors, before its capital is depleted (Danielson, Embrechts, Goodhart, Keeting, Muennich, Renault and Shin, 2001) ^[10]. There is a general agreement that statutory capital requirements are necessary to reduce moral hazard. The question has been how much bank capital is needed. Despite the debate, capital adequacy is evaluated in relation to supervisory guidelines; overall financial condition; the nature, trend, and volume of marginal and sub-quality assets; intangibles; off-balance sheet activities, and earnings; balance sheet composition, interest rate risk, concentration risk, and non-traditional activity risk, growth trends and prospects; and the strength of management. The macroeconomic concerns surrounding Basel Capital Accords can be divided into two specific categories.

The first issue is whether Basel Capital Accords lead to reduced loan supply to certain sectors of the economy. The second concern is whether it impacts the cyclical behaviour of bank lending and affects macroeconomic dynamics. The first concern raised about capital adequacy requirements is that they may cause a credit crunch affecting the macro-

economy (Choi, 2008) ^[9]. According to Basel Committee on Banking Supervision (2008), the broad nature of risk classes gives considerable scope for substitution between more and less risky assets. If a bank's capital adequacy ratio becomes very low, a banking institution can raise more capital; curtail its lending; and or shift its portfolio towards assets with lower risk-weights. Borio, Furfine and Lowe (2001) ^[4] point out, that banks are likely to choose the most cost-effective way of meeting the capital adequacy requirement. Given that the cost of raising new capital is usually very high for financially weak institutions, banks are likely to reduce their lending in order to fulfil the regulatory requirement. If many banks behave in this fashion at the same time, it would lead to a reduction in the aggregate loan supply to the economy. Several empirical analyses (Chami, and Cosimano, 2001; Borio, Furfine and Lowe, 2001; Griffith-Jones, Segoviano, and St. Spratt, 2002; Choi, 2008; Furlong, 2008) ^[6, 4, 15, 9, 12], support that banks subjected to strict capital adequacy requirements curtail their lending in response to a negative shock to their regulatory capital. Such a reduction in bank loans would not affect the real output, as long as firms can quickly find alternative sources of finance.

However, given the presence of asymmetric information in the Zimbabwean financial market and a shallow capital market, this may not be feasible for some borrowers, who are forced to curtail their investment. A fall in loan supply is therefore likely to affect the smaller to medium enterprises as they tend to have little access to the stock exchange through listing and private placements. In this regard, a fall in bank capital or an increase in capital adequacy requirement leads to a reduction in aggregate loan supply and output for bank dependant firms. Capital adequacy requirements may also affect the monetary transmission mechanism. If some firms are bank dependent, the responsiveness of loan supply to changes in monetary policy determines the strength of the transmission mechanism. In the presence of capital adequacy requirements, the strength of the monetary transmission mechanism may depend upon how well banks are capitalized.

In a simple static model, Brunner, Allan and Kamin (1998) ^[5], shows that if the capital adequacy requirement is binding, bank loans may not respond at all to a monetary expansion. The monetary transmission mechanism is weakened if banks are poorly capitalized, or the capital adequacy requirement is very stringent (Altman and Saunders (2008) ^[1]). In a consultative paper published in 2001, the Basel Committee proposed that credit exposures to unrated firms receive a minimum of 100 percent risk-weight under Basel II. This has raised concerns that Basel II may cause a credit crunch affecting unrated firms, most of which are small- and medium -sized enterprises (SMEs). According to the study by Baltagi, (2008) ^[2], Basel II on average lead to a 1 percentage point reduction and a 1.5 percentage point increase in the required capital for lending to an OECD corporation and a corporation in the poorer countries, respectively. Another major concern surrounding Basel II is that it may increase the cyclical volatility of bank loans and output. Given that credit risk tends to fall during booms and rise during recessions, the risk-weights on assets under Basel II are likely to undergo countercyclical fluctuations, so that banks become more capital-constrained during recessions and less so during booms. Raising new capital, on the other hand, tends to be less costly during

booms and more expensive during recessions. In view the foregoing, banks operating under Basel II have stronger incentives to expand their lending aggressively during economic upswings and cut it sharply during downturns. Such lending behaviour may in turn exacerbate the cyclical volatility of output. Basel II may also weaken the short-run effect of a monetary expansion during economic downturns as banks may not be able to expand their loan supply no response to an increase in money supply.

It is, possible that a monetary expansion relaxes banks' capital constraints after a time lag and stimulates the economy, which in turn may improve borrowers' balance sheet conditions and their credit quality. If so, the dynamic response of bank loans to a monetary stimulus would be stronger under Basel II, even though this might come with some delay. On the other hand, it is also possible that the initial failure of the monetary expansion to stimulate banks' loan supply forces some firms to reduce their investments, which could lower firms' net worth and reduce their credit quality next period. This in turn could discourage banks from lending to these firms, so that it is also possible that a monetary expansion fails to stimulate the economy for a sustained period under Basel II.

On the other hand, a non-performing loan is an advance by a financial institution that is not earning income and full payment of principal. As such interest is no longer anticipated (Van Greuning and Bratavonic, 2003) ^[24]. There is no global standard to define non-performing loans at the practical level. Variations exist in terms of the classification system, the scope, and contents. This pitfall potentially adds to disorder and uncertainty in the non-performing loans subject. For instance, as described by Park (2003), during the 1990s, there were three different methods of defining non-performing loans: the 1993 method based on banking laws; the 'Bank's Self-Valuation' in March 1996; and the 'Financial Revival Laws-Based Debt Disclosure' in 1999. These measurements have gradually broadened the scope and scale of the risk management method in the banking industry.

The literature that examines non-performing loans has increased as more researchers attempt to understand the major factors that cause financial instability. This trend has arisen due to the role played by impaired assets in financial instability as evidenced by the strong association between non-performing loans and banking crises. In most of the economies that collapsed, credit risk preceded financial crises. Khemraj (2005) revealed that the banking crises in East Asia and Sub-Saharan African countries were preceded by high non-performing loans. This stimulated research in trying to establish the causes of non-performing loans in banks. Caprio (1998) had earlier presented stylised evidence and found that inadequate regulation and lack of supervision at the time of the liberalisation could play a key role in explaining why deregulation and banking crises were so closely entwined. The analysis of Kaminsky and Reinhart (1999) provides interesting insights on the links between financial crises with financial liberalisation. The study found that the proxy variable for financial liberalisation which was the growth in domestic credit as a ratio of output, accelerated greatly as the crises emerged.

Earliest studies to examine the causes of loan losses were by Keeton and Morris (1987). The study showed that local economic conditions along with the poor performance of certain sectors explain the variation in loan losses recorded

by the banks. The study also reports that commercial banks with greater risk appetite tend to record higher losses. Garey (1991), also concur with the early studies of Keeton and Morris. Garey (1991) found that loan loss experience of large commercial banks in the US was influenced by both internal and external factors. This study found a significant positive relationship between the loan-loss rate and internal factors such as high interest rates, excessive lending, and volatile funds. Non-performing loans were influenced by gross domestic product growth, high real interest rates, lenient credit terms and excessive lending by commercial banks (Goacher, 2002; Howells and Bain, 2002; Heffernan, 2005; Freixas, 2007 and Machiranjju 2008) [14, 17, 16, 11]. In Zimbabwe, Chikoko *et al.*, (2012) [8] their research findings show that some banks were sitting on NPLs due to poor credit analysis processes; wrong products offered to the clients; lending based on balance sheet strength instead of cash flow based lending; banks taking too much comfort in security; information asymmetry leading to moral hazard; economic environment and political influence. Their key recommendations included that of an urgent setting up of a credit bureau; and also that banks should not adjust client’s request. Their study emphasised the need for banks to consider the economic environment and adjust their credit culture.

The research of Boudriga, Taktak and Jellouli (2009) illustrates that Capital to risk weighted asset ratio reduce the level of problem loans which means higher Capital leads to less credit risk. However, Rime (2001) findings indicated a positive relationship in his research between bank risk and capital ratio of Swiss banks. Goddard *et al.* (2004) study the significant factors of productivity of banks in Europe. They found a positive relationship between the bank capital and treasury to loans (The World Bank, 2014). Samy and Magda (2009) explore the effects of capital regulations on the performance of banks in Egypt. The research provides a comprehensive framework to measure the impact of capital on two indicators of bank performance: cost of intermediation and profitability. The result of the research indicates that higher capital to risk weighted ratio ‘...increase the interest of shareholders in managing bank’s portfolio’, which generates ‘...higher cost of intermediation and profitability’ (Samy and Magda, 2009).

Total capital is a measure of bank’s financial strength since it shows the ability to withstand tolerate with operational and abnormal losses. It also represents the ability to undertake additional business (Habtamu, 2012). As noted by Makri *et al.* (2014) Capital Adequacy ratio determines risk behaviour of banks. It is a measure of banks solvency and ability to absorb risk. Thus, this ratio is used to protect depositors and promote stability and efficiency of financial systems. Despite the abundant literature on NPLs, to the researchers’ knowledge, no study has been done on the impact of capital adequacy ratio (CAR) on non-performing loans (NPLs) on Zimbabwean commercial banks after dollarisation in 2009. Therefore, this study determines the impact of CAR on NPLs amongst Commercial Banks in Zimbabwe post-dollarisation era.

6. Materials and Method

This section explores econometric methodology applied in the study to establish the impact of CAR on NPLs in Zimbabwe. The study employs secondary annual time series data set from 2009 to 2015. Ordinary least squares (OLS)

was used to estimate the equation. The estimation of the equation was such that unit root test were undertaken to determine the order of integration of the variables and that was done using the Augmented Dickey Fuller (ADF) test. Some other statistical tests were done. Lastly, diagnostic tests were done to determine if the chosen model is well specified. The theoretical basis of the model is a linear relationship between the dependent variable, non-performing loans (NPLs) and the explanatory variable, Capital Adequacy Ratio (CAR).

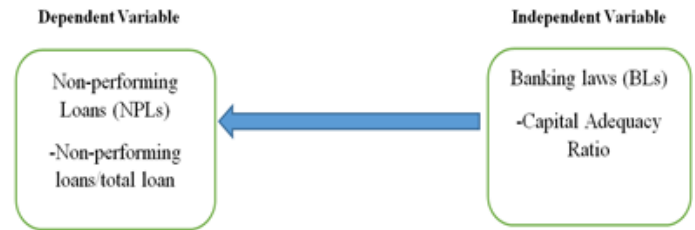


Fig 2: Theoretical Relationship between NPLs and CAR.

$$NPLs = F(CAR) \dots\dots\dots (1)$$

Where,

NPLs-is Non-performing loans

CAR -is Capital Adequacy Ratio

Logarithms of the variables is then undertaken because most of the economic time series data are non-stationary.

$$NPLs(t) = \beta_0 + \beta_1 CAR(t) + U(t) \dots\dots\dots (2)$$

The expected signs from the regression equation to be estimated are as follows:

7. Data Analysis and Interpretation of Results

This section focuses on the empirical estimation, presentation and economic interpretation of the regression results carried out using the methodology highlighted in the previous section.

Preliminary Tests

Table 1 shows descriptive statistics of the dependant and explanatory variables used in the study for the period 1990 to 2017. Maximum and minimum statistics rule out the possibility of outliers in the data used as the data were transformed logarithms to reduce its variability and enable direct estimation of the parameters. Classical linear regression requires that the residuals be normally distributed and judging by the probability values of the Jarque-Bera, the two variables follows a normal distributed therefore, unit root tests can be conducted.

Table 1: Descriptive Statistics.

	NPLs	CAR
Mean	5.457143	3.200000
Median	25.77285	11.31000
Maximum	60.00000	18.49000
Minimum	13.07000	1.800000
Std. Dev	19.63867	6.124633
Skewness	1.034454	0.495831
Kurtosis	2.229418	1.840653
Jarque-Bera Probability	14.21637	13.48263
Observations	7	7

Stationarity Test Results

The stationarity and unit root tests of the data used in this study were conducted using Augmented Dickey-Fuller test

and the results are shown below:

Table 2: Unit Root Test

Variable	t-ADF Statistic	Critical1%	Critical5%	Critical10%	Conclusion
CAR	-21.67319	-5.604618	-3.694851	-2.982813**	1(0)
NPLs	-18.91758	-5.119808	-3.519595	-2.898418**	1(0)

*, ** indicate significance at 1% and 10% respectively

The results from the ADF test became stationary at levels. The next stage involves testing the existence of the cointegration relationship among the variable using Johansen Cointegration Test. Table 3 below presents the cointegration test results.

Table 3: Cointegration Test Results.

Hypothesised No. of CE (s)	Eigen Value	5% Critical Value	Prob.**
None*	0.736549	13.39875	0.0389
At most 1	0.274592	24.27463	0.3758
At most 2	0.387590	17.18598	0.3385
At Most 3*	0.850284	2.856309	0.0497

*Denotes rejection of the hypothesis at the 5% (1%) significance level.

The hypothesis of no cointegration is rejected suggesting that there exists a long-run relationship between the two variables. This is because the statistical values of those tests were greater than their critical values. When the cointegration exists, it means CAR and NPLs share a common trend and long-run equilibrium as suggested. However, the statement of cointegration of 'At most 3', was rejected. There being evidence of cointegration between the variables, and that the data for the variables are static as proved by the stationarity results, the following Table 4 exhibits results for estimated Ordinary Least Squares (OLS).

Table 4: Ordinary Least Squares. Dependent Variable: (NPLs)

Variable	Coefficient	Std. Error	t-Statistic	Prob
CAR	-0.264125	0.074160	-3.561580	0.0162
C	18.11726	2.339051	7.745560	0.0006

R-Squared= 0.717272

Adjusted R-Squared = 0.660727

F-Statistic = 12.68485

Durbin Watson Statistic (DW) =2.092737

Table 4 shows the estimated results exhibiting the coefficient value of the explanatory variable as well as indicating through the probability value whether explanatory variable is significant. According to the estimated model above, the relationship between Non-Performing Loans and Capital Adequacy Ratio exhibits a negative co-efficient of -0.264125 against a statistically significant P-value of 0.0162. This suggests that a unit increase in Capital Adequacy Ratio would result in 26% decrease in non-performing loans. The value of the adjusted R-squared is 72%, suggesting that 72% variation in non-performing loans is explained by the CAR. The Durbin Watson Statistic of 2.092737 means that there is no serial correlation in the variables.

After conducting OLS test, the statistical properties of the model were then assessed. Diagnostic tests were carried out to test for serial-correlation, heteroscedasticity, normality and specification. The results are presented in Table 5 below.

Diagnostic Tests

Table 5: Diagnostic Test Results

	F. Statistic	Probability
Specification Error: Ramsey Reset Test	6.125172	0.050589
Serial Correlation: Breusch-Godfrey Serial Correlation LM Test	0.274505	0.8718
AR Conditional Heteroscedasticity (ARCH): Breusch -Pagan- Godfrey	2.191982	0.1387
Normality: Jacque-Bera	0.588113	0.745234

As shown in table 4 above, the diagnostic tests carried out show that the model is reasonably well specified and that the residuals are homoscedastic and serially uncorrelated. The following section presents the conclusion and recommendations.

8. Conclusion

This study found out that the two variables analysed have an inverse relationship, whereby one-unit increase in Capital Adequacy Ratio (CAR) results in the decrease of non-performing loans (NPLs) by 26%. These results have important policy implications. The results suggest that increased capital adequacy lead to a decline in non-performing loans.

9. Policy Recommendations

There is, therefore, need for the introduction of higher minimum bank capital requirements which may well induce slowdown or contraction of bank lending in Zimbabwe. The enforcement of capital adequacy requirements would significantly curtail credit supply. Opening up to foreign investors may be an effective way to partly shield the banking sector from negative shocks arising from non-performing loans. There is also need to monitor the financial conditions of the banking sector continuously if monetary policy is to become an effective tool to counter the procyclicality problem inherent in the banking sector. The Reserve of Zimbabwe should give the financial regulators some discretion over the regulatory penalty imposed on banks that violate the capital adequacy requirement. Over and above the given recommendations, there is need to urgently establish a credit bureau that will facilitate the dissemination of credit information. Furthermore, credit analysts should be trained in credit intelligence to equip themselves with adequate and efficient skills in loan management. This is in light of data for non-performing loans shown Figure 1, where non-performing loans for period 2012 to 2015 were more than the capital adequacy. Commercial banks need to come up with workout strategies that clearly define how different types of loans at different stages are to be dealt with. Supervisors should come up with devices that would enforce commercial banks to adhere to banking prudential guidelines.w:

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