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The Impact of Credit Risk Management on Commercial Banks Performance in Democratic Republic of the Congo

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ABSTRACT: *The main objective of this study was to find the impact of credit risk management on the financial profitability of the Congo's commercial banks. The specific objectives were to find the effects of CAR and NPLR considered as independent variables on the performance of commercial banks while the dependent variables were ROE and ROA. We used commercial banks in the Democratic Republic of the Congo as a study population, and as a sample the four largest banks from 2009 to 2016. Using a fixed effects model specification a panel Estimate Generalized Least Squares regression was done on the data using E views software. Adopting a 5% non-directional test of hypothesis, the study found a capital adequacy ratio has statistically significant effect on commercial banks performance in Democratic Republic of Congo. For the second objective which was to determine the relationship between non-performing loans ratio and performance of banks, the study also concluded that NPLR has statistically significant effect on commercial banks. But we have remarked that there is a negative relationship between NPLR and ROE and ROA; and there is a positive relationship between the car and ROE and ROA. The results of the study reveal that banks with high capital adequacy ratios can better advance more loans and absorb credit losses each time they face it, especially in the context of Congolese banks where the uncertainty of reimbursement is high and thus record a better profitability.*

KEY WORDS: credit risk management, profitability, commercial banks, car, NPLR, ROA, ROE

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INTRODUCTION

Banks plays a major role in all economic and financial activities in modern society. One of the main activities of the banking sector in the world and, in particular, in DR Congo, is the creation of credits to deserving and deficit units of the economy.

According to Carey Anthony, risk management is more important in the financial sector than in other parts of the economy. But it is a very difficult operation. The basis of banking and similar financial institutions is taking risk in conditions of uncertainty (Carey, 2001). However, it should be borne in mind that banks are very fragile institutions that are built on customer confidence, brand reputation and especially the dangerous leverage effect. In case something goes wrong, banks can collapse and the failure of a bank is enough to send shock waves through the economy (Rajadhyaksha, 2004).Credit is the main activity that generates more revenue for banks, but this activity involves huge risks for the lender and the borrower. Banks are exposed to a wide range of risks during their operations and these banking risks are generally divided into three categories: financial, operational and environmental risks (Greuning & Bratanovic, 2009). The risk of a customer not fulfilling his obligation under the contract on the due date or at any time can significantly affect the proper functioning of the bank. On the other hand, a bank that has a high credit risk also has a strong chance of falling bankrupt and exposes the depositors to risk of loss. Among the risks facing banks, credit risk is one of the main concerns of most banking authorities and bank regulators. This is because the credit risk is a risk that can easily and most likely cause the bank's bankrupt. The creation of credit requires prudent management of the risks associated with it.

According to (Chijoriga, 2011) Credit risk is the most critical and costly risk associated with financial institutions and its impact on performance is quite significant compared to any other risk associated with the banking sector as it is a threat Direct credit for the institution. The presence and importance of credit risk require its prudent measure and the management of the good financial health of any financial institution. Credit risk measurement and management has evolved a lot over the last two decades in response to a number of situations that have made it more important than ever. These situations are observed by a considerable increase in the number of banks bankrupt worldwide but also and especially in the developing countries such as the DRC. For all of these issues, banking professionals have developed new management practices and risk measurement among other credit-rating/alert system or the development of new model the price risk (for example the risk adjusted return on capital models (RAROC)) and developing models to better measure the instruments off-balance sheet credit risk (Altman and Saunders, 1998).

Credit risk management and its effects on the performance of banks has never been easy and challenges including poor performance which broods trend of banks and leading to unfavourable banking performance with little clear balance, bank failure and the crisis in the financial sector, leading to a systemic risk and thus have a negative functional branching on economic growth (Almekhlafi, Khalil, Kargbo and Hu, 2016). The strategies for credit risk management include transferring to another party, avoiding the risk, reducing the negative effects of the risk, and accepting some or all of the consequences of a particular risk. The very nature of the banking business is so sensitive because more than 85% of their liability is deposits from depositors (Saunders & Cornett, 2008). Banks use these deposits to generate credit for their borrowers, which in fact is a revenue generating activity for most banks. This credit creation process exposes the banks to high default risk which might lead to financial distress including bankruptcy. All the same, beside other services, banks must create credit for their clients to make some money, grow and survive stiff competition at the market place.

Banks in general and Congolese in particular use different management methods that allow them to hedge against the risks of bank credits to improve their performance at different level.

The country's financial system has been severely affected by the effects of war, political instability, and monetary policy that is not predictable. The level of financial intermediation is low: credit is essentially informal, and formal bank lending to the private sector is less than 3% of GDP. Private banking is generally poorly developed, and most banks act as government financial agents or grant credits only to international institutions operating in the country. Foreign commercial banks dominate the industry as funding providers for the mining and oil sectors. 90 per cent of the total deposits and 95 per cent of the loans were held in foreign currencies in 2008, although these trends had a change at the beginning of 2009 due to low export earnings. However, this trend persists mainly following the recent surges in prices and the galloping depreciation of the local currency. Most applicants have a clear preference for the US dollar compared to the Congolese franc.

The financial sector has also been adversely affected by the global financial crisis and remains fragile, with a risk-capital ratio of about 15 per cent towards the end of September 2009, an increase in the rate of 11 per cent over the previous year. The economic slowdown reduced institutional repositories, while a high rate of inflation and an unstable exchange rate allowed a greater dollarization of the economy.

Access to banking services, both for entrepreneurs and for individuals, is very limited and is often reserved for the wealthy. The DRC has one of the lowest rates of bank penetration in the world, with six deposit accounts only for 1 000 adults, and bank loans to individuals account for less than 5% of all bank lending operations. The strength and vulnerability of the banking system remains

an important issue. Many banks have been unable to meet the required level of liquidity. The ratio of low- yield loans to gross global loans increased from 2.77 per cent in 2008 to 10.6 per cent in September 2009, although this may be attributed, in part, to improvements in the accuracy of reporting. Three local banks have also shown signs of distress and need recapitalization.

In an environment as difficult as it is uncertain, whether political, economic or social, in which entrepreneurs are evolving in the DRC, the banking system being the only channel that puts in relation lenders and borrowers, it is quite normal for this sector to be the most exposed to many risks.

LITERATURE/THEORETICAL UNDERPINNING

This section of the paper concentrates on the theoretical foundations and contributions of other scholars on the subject matter.

Juvin (2001) in its analysis distinguishes eight classes of risk: business risk, computer risk, operating risk, legal and fiscal risk, political risk, risk of competition, environmental risk, and resource risk.

An important literature is concerned with the concept of risk and performance. This literature derives from the modeling of Shrieves and Dahl (1992) which demonstrates a simultaneous and positive influence between the evolution of the level of capital and the evolution of the level of risk of the American banks. Thus, an increase in the level of risk corresponds to an increase in the level of own funds held and vice versa. Similarly, other work confirms this relationship namely Kwan and Eisenbeis (1995) for U.S. banks, Altunbas et al. (2004) for European banks, Heid et al. (2004) for the German and Godlewski Banks (2004) for the banks of the developing countrie.

Other work has come to the same conclusions on the merits as Shrieves and Dahl regarding the bank's risk-taking, but there is a point of distinction that lies in the indicator of the level of capital that is retained in these studies. In the work of Shrieves and Dahl and those who followed and demonstrated a positive and simultaneous influence, the selected indicator is the equity ratio on total bank assets. However, the work of Jacques and Nigro (1997), Aggarwal and Jacques (2001) for American banks, Van Roy (2003) for the European banks, Rime (2001) for the Swiss banks and Murinde and Yaseen (2004) for African and Middle Eastern banks find a simultaneous but negative influence between the level of capital and the level of risk. The indicator of the capital level retained is the Cooke ratio, which is a ratio that incorporates risk weights according to the nature of the bank asset. These results seem to appear to be different, but the interpretation leads to a recognition of the interest of Cooke regulation in the constraint of excessive risk taking of banks. Finally, the work of Kwan and Eisenbeis (1995), Altunbas et al. (2004) and Godlewski

(2004) show a simultaneous but negative influence between the level of risk and the performance of the bank. This result indicates that an increase in the bank's risk level leads to a decrease in performance and vice versa. This result is in line with the recommendations of the Basel Committee and stresses the importance of reducing risk taking to improve the bank's performance.

2.1. Definition of bank credit

For Petit-Dutaillis (1967), to take credit is to trust but it is also to give freely the actual and immediate disposition of a real property or a purchasing power, against the promise that the same good or equivalent property will be returned to you in a Certain time, most often with remuneration for the service rendered and the danger accrued, danger of partial or total loss that the nature of this service implies.

According to Bernard and All (1989), credit is an act of trust involving the exchange of two benefits dissociated in time, assets or means of payment against promise or prospect of payment or reimbursement.

Of these two definitions we mainly raise three essential notions in the granting of appropriations:

i. the trust that must exist between the Contracting Parties;
ii. -the time factor that is extremely important in this type of operation;
iii. The promise to repay the loaned property.

According to Rouach et al (1998), bank risk can be defined as a commitment *t* uncertainty with a likelihood of gain and injury, whether it be a degradation or a loss.

Sampson (1982) for his part considers that the tension that inhabits the bankers is inseparable from their trade, they take care of the savings of others and thus they benefit by lending them to others which inevitably involves risks. He goes on to state that a banker who does not take a risk is not one.

According to Martinet et al (2000), the risk is a random phenomenon corresponding to a situation where the future is predictable only with probabilities.

Typology of bank credit risks

Credit risk is the most important and most dangerous risk that a bank is exposed to. The latter must pay particular attention to its management so as not to be plagued by its consequences.

Credit risk can be defined as the potential loss resulting from a debtor's inability to honor his or her commitments. It also means, in a broader way, the risk of loss linked to the degradation of the quality of the consideration which results in a degradation of its grade.

The credit risk may take several appellations: there is the talk of counterparty risk in the interbank and financial market lending transactions, and the risk of bankruptcy or credit itself, for transactions in the credit market.

Apart from the risks common to all enterprises (risks of logistics, legal....), banks are faced with specific risks inherent in their activities: the granting of appropriations.

These risks are not purely hypothetical. However, when they do come true, they can have serious consequences.

Sardi (2002) inventories a dozen risks of bank credits grouped in these categories: the risk of consideration, the particular risk to a customer or an operation, the risk of rates.

The counterparty risk

According to Calvet (2002), in a very general way, the risk of consideration or credit or signature, is the risk of failure of a counterparty on which a receivable or a non- balance-sheet commitment is held. At first, credit risk is, therefore, the risk of a loss in the event that the counterparty proved unable to meet its commitments. This is the most dangerous and most common risk for a bank.

This is a client's non- compliance with his or her financial commitment to know, in the majority of cases, a loan rebate.

The particular risk to a customer or an operation

The particular risk to a client depends on elements that do not go beyond the scope of a case. It depends on the financial, industrial or commercial situation of the company, as well as the technical competence and morality of its executives.

The appropriations granted to companies which lack resources, which have too much capital, which does not have sufficient working capital, which are over-indebted or whose cash is heavy, have fairly large risks.

Obsolete industrial installations or, unlike sumptuous installations, excessive overheads, exaggerated cost prices, poor quality of production or, on the contrary, good quality but too expensive, must inspire the Banker a certain prudence.

Likewise, the technical competence of the company's leaders plays a key role. Indeed, a poorly directed case is almost inevitably doomed to disasters, even if the circumstances are provisionally favorable.

The particular risk to an operation depends on its nature, its duration, its amount, especially when it has been fixed too much in relation to the customer's surface.

The risk of rate

The type of risk originates from the bank's activities of making loans and providing them with a collection. The rate risk arises when the cost of resources becomes higher than the revenue received on the jobs.

The rate risk is identified by seeing the results adversely affected by the movements of interest rates (Bessis, 1995). This risk never materializes during the realization of the credit because, at a given moment, it will be absurd that a bank lends at a rate lower than the cost of its collection. The risk of rates can therefore only appear over time and only if the durations of jobs and resources are not perfectly backed up (there is perfect bone-in when jobs and resources are over the same duration, preserving in time the Margin of the bank).

Even in a perfect situation, the risk may arise when borrowers (depositors) come to repay (to be reimbursed) their loans (their investments) in anticipation. In this case, the originally planned reverse disappears.

The risk of default

This form of risk is associated with the occurrence of a defect, characterized by the inability of the counterparty to ensure payment of its due dates.

The Basel Committee in its second consultative document considers a debtor to be in default when one or more of the following events are found:

- The borrower is not likely to repay in full its debts (principal, interest and commissions);
- The finding of a loss on one of its facilities: recognition of a loss, restructuring of distress involving a reduction or rescheduling of the principal, interest or commissions;
- The borrower is in default of payment for ninety (90) days on one of his credits;
- The borrower is in legal bankruptcy.

The risk of recovery

The recovery rate is used to determine the percentage of the debt that will be recovered by undertaking court proceedings, following the failure of the counterparty.

The recovery will cover the principal and the interest after deduction of the amount of the guarantees previously collected. The recovery rate is a source of uncertainty for the bank insofar as it is determined through the analysis of several factors:

- The length of judicial proceedings which vary from one country to another;
- The real value of the guarantees;
- The rank of the bank

A Review of Related Empirical Literature

A number of studies have been conducted on risk management. A robust risk management framework can help organizations to reduce their exposure to risks, and enhance their financial performance. Further it is argued that the selection of particular risk tools tends to be associated with the firm's calculative culture the measurable attitudes that senior decision makers display towards the use of risk management models. While some risk functions focus on extensive risk measurement and risk-based performance management, others focus instead on qualitative discourse and the mobilization of expert opinions about emerging risk issues (Mikes and Kaplan, 2014). .Kaaya and Pastory (2013) showed that credit risk indicators negatively affected on the bank performance. Ogboi (2013), concluded that bank's financial performance had been affected by sound credit risk management and capital adequacy. Effective risk management is critical to any bank for achieving financial soundness. The indicator of Nonperforming loans had positive impact on banks profitability as measured by return on equity (ROE) and return on assets (ROA).

In a study conducted by Ogboi & Unuafe (2013) on six banks in Nigeria during the period of 2005 to 2009 on the impact of credit risk management and capital adequacy on the financial performance of banks, found that the ratio of non-performing loans to total loans and advances and liquidity ratios do not significantly affect the performance of banks, while total loans and advances to total deposits have a significant negative impact on the financial performance of banks, and capital adequacy has a positive effect on the banks' return on assets.

Yimka et al. (2015) studied the impact of credit risk management on the profitability of Nigerian banks, where 10 banks were studied from 2005 to 2010 and the results were that the rate of total non-performing loans and advances to total loans and advances does not significantly affect the banks' profitability. Another study on ten Nigerian Commercial banks conducted by Oluwafemi

et al. (2014) about the impact of credit risk management on the banks' financial performance measured by return on assets (ROA) during the period 2006-2009 concluded that the non-performing loans and liquidity ratios do not have a significant impact on the Nigerian commercial banks' financial performance.

METHODOLOGY

The research was based on quantitative research approach. A case study was chosen as the most appropriate research strategy. Descriptive research was used to collect detailed information, while analytical research has been used to analyze phenomenon. The main sources of data were financial reports, annual reports, text books, articles and company publications that included brochures and magazines, from 2009 to 2016. Because the data contains information on cross sectional units observed over time, a panel data estimation technique is adopted. This allows us to perform statistical analysis and apply inference techniques in either the time series or the cross−section dimension.

In this study, we use two indicators to measure the credit risk management: capital adequacy ratio (CAR) and non-performing loans ratio (NPLR), which are main indicators used to assess the soundness of the banking system. The calculation of CAR follows three steps. There are two methods to calculate CAR; one is using the total capital while another one is using only Tier 1 capital. In our research, we plan to use the model as previous researchers (Kargi, 2011; Epure and Lafuente, 2011). Therefore, we will use the former one as the formula for calculating CAR. That is,

CAR=Total Capital/Total Assets……... (2)

As to NPLR, it is calculated as:

NPLR = NPLs/Total Loans……... (3)

Where NPLR is non-performing loan ratio, NPLs is non-performing loans.

Non-performing loans (NPLs) are defined as the loans overdue by more than 90 days (Louzis et al., 2011). It should be the gross value of the loan as recorded in the balance sheet not just the amount that is overdue, according to World Bank (2013).

Return on equity (ROE) and return on assets (ROA) are two measures for commercial banks' profitability. The data used to calculate these two ratios are retrieved from the financial statements from year 2010 to 2016 of commercial banks which are publicly available online. All the values that we have retrieved are book values. The information we retrieved is each bank's Net Income

(profit for the year), Total Assets, and Total Equity. When calculate the ROE, we use the function as:

ROE = Net Income/Total Equity Capital ……. (4)

Where Net Income means the net income after tax Total equity capital is contributed by the bank's shareholders.

The estimation of ROA follows the formula as:

ROA = Net Income/Total Assets …… (5)

Where net income can be collected from income statement Total assets and total equity are available from the balance sheet.

Hypothesis

Previous researches have been inclusive in the relationship between credit risk management and profitability of commercial banks. Therefore, it becomes a topic that is worth studying. We will perform our study based on the data we have collected from annual reports of 4 largest banks in DR Congo, from year 2009 to 2016. In the previous chapters, we have explained all the indicators which have been selected to present credit risk management and profitability of commercial banks. And then we can imagine our hypotheses:

- *Ho1: There is no significant relationship between performance and the non– performing loans of banks in DR Congo.*
- *Ho2: There is no significant relationship between performance and the credit adequacy ratio of banks in DR Congo.*

Model Specification

To test the hypotheses, we have made in the last part, we need to build regressions to measure the relationships of dependent and independent variables. The regression analysis tests the statistical strength of the model as hypothesized (Parramore & Watsham, 1997). The technique we decide to use to build to the model is Ordinary Least Squares (OLS). The general form of OLS uses a set of data to create an estimated equation like:

$Yi = \beta o + \beta 1 Xi + \varepsilon i$ ……. (6)

Where:

I goes from 1 to N and indicates the observation number

Xi is the independent variable

Yi is the dependent variable

βo is the intercept

β1 is the slope

ϵi is the residuals

We will employ the model that previous researchers have used, considering that we have more than one independent variable. Therefore, we need to move from single-independent-variable regressions to equations with more than one independent variable.

That is to say, multivariate regression model needs to be introduced:

$Yi=\beta o+\beta 1X1i+\beta 2X2i+\ldots\ldots\ldots\ldots +\beta nXni+\varepsilon i$ …… (7)

Where:

I goes from 1 to N and indicates the observation number

Xi is the independent variable

Yi is the dependent variable

β0 is the intercept β1 is the slope

ϵi is the residuals

A multivariate regression coefficient indicates change in dependent variable associated with one unit increase in one independent variable, holding other independent variables constant (Studenmud 2011). Based on all the information above, we therefore we will perform the following regressions:

$ROE_t=\alpha+\beta_1 CAR_t+\beta_2 NPLR_t+\beta_3 LNTA_t$…… (8)

$ROA_t= \alpha+\beta_1 CAR_t+\beta_2 NPLR_t+\beta_3 LNTA_t$…… (9)

Where,

ROE_t is the return on equity at time t

ROA_t is the return on asset at time t

CAR_t is the capital adequacy ratio at time t

$NPLR_t$ is the non-performing loan ratio at time t

$LNTA_t$ is the natural log

RESULTS/FINDINGS

In this section we will present the results of the analyses we have done on E VIEWS and we will discuss and judge the validity of the assumptions set out in the previous sections.

Descriptives statistics

Variables	N	Median	Min	Max	Mean	Std.Dev.
ROE	31	0.1000000	0.003000	0.219000	0.101961	0.061160
ROA	31	0.010200	0.000900	0.020000	0.010852	0.005576
CAR	31	0.205000	0.163000	0.292000	0.215061	0.029761
NPLR	31	0.044000	0.009000	0.160000	0.047710	0.036896
LNTA	31	19.84132	16.01346	20.81455	19.26908	1.502236

Table 1: descriptives statistics, Source: Research data

Based on the data presented on the table, the following trends indicate: We note that on average all bank ratios in this study are positive, with the exception of ECOBANK, which recorded negative ROE and ROA for the year 2016. And this trend affects most of the banks that have experienced a decline in profitability, although the BCDC is doing pretty well. It should be noted that since 2015 the economic situation of the country in general is rather gloomy following the degradation of the value of the Congolese Franc in the face of foreign currencies.

For ROE, it was highly volatile, with a peak observed at 21.9% and a hollow of 0.3%. ROA is relatively low, with a figure of 2% as the highest index.

NPLR was also volatile and reached a peak of 16% and a low of 0.9%. The other variables are more or less equally distributed for the period under study.

Capital Adequacy is very important for the solvency and profitability of banks. This is because the business of banking is risky due to the possibility that loans may not be paid back leading to financial losses to the bank. Banks are therefore required to have adequate capital, not only to remain solvent, but to avoid the failure of the financial system. The CBC requires commercial banks maintain a 10% capital adequacy ratio.

Hausman Test

Results Panel data analysis normally involved two main models, and these are: Fixed effect and Random effect.

Fixed effect model is used when you want to control omitted variables that differ between cases but are constant over time (Samy, 2003). This model helps to track changes in the variables over time to estimate the effect of independent variables on dependents variables.

The main technique used for analysis of panel data is fixed effect. Statistically, fixed effect is always a reasonable thing to do with panel data because they give consistent result but may not be the most efficient model to run.

The random effect is used where some omitted variables may be constant over time but vary between cases, others may be fixed between cases but vary over time. To compare between fixed effect and random effect the Hausman test is used. Hausman Test compares fixed effect with random effect in E VIEWS. Running a Hausman specification test at five (5) percent level enables the researcher to choose between fixed and random models. As the table below shows, we will use the fixed model.

Correlated Random Effects – Hausman Test			
Test cross-section and period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section random	14.513210	3	0.0023

Table 2: Hausman Test Results

Normality Test

The Skewness-kurtosis test is theoretically similar to the Jarque- Bera. The null hypothesis of this test is the lack of normality of errors against the alternative hypothesis of normality of errors. The conclusion of the test is that the residues from the estimation of the effect model are normally distributed.

Multicollinearity Test Results

Before presenting the regression analysis, we test our model for multicollinearity.

Multicollinearity is a situation where the explanatory variables are nearly linear dependent (Jurczyk, 2011, p. 262). According to the results of this study, we can observe that the highest

correlation among all the variables is -0.670036 which is the correlation between NPLR and LNTA. However, researchers always prefer an absolute value larger than 0.8 to be enough to cause multicollinearity (Studenmund, 2011, p. 258). Most of variables are significant, that means in our model the problem of multicollinearity is small. In others words, the independents variables can influences dependent variables.

Regression Results

Hypothesis 1 is about the correlation between CAR and NPLR and ROE of commercial banks.

$ROE_t=\beta 0+\beta_1 CAR_t+\beta_2 NPLR_t+\beta_3 LNTA_t$

Variables	Coef.	Std.Error	T	P>|t|	R^2
Constant	0.584277	0.510918	1.143584	0.2641	0.555750
CAR	0.991906	0.418690	2.369070	0.0262	
NPLR	-0.903730	0.359544	-2.513547	0.0191	
LNTA	-0.033864	0.027439	-1.234130	0.2291	

Table 3 Regression 1

The first analysis of the regression gives us the following results: the P-value for the CAR is 0.0262 and for the NPLR its P-value is 0.0191. Under the condition that the level of significance is 5 percent, a p-value less than the 5 percent should be required to reject the first part of the null hypothesis which is there is no correlation between CAR and ROE and the second part of the null hypothesis that there is no correlation between NPLR and ROE.

With regard to the results, the null assumptions are to be rejected and we accept the alternative hypotheses, which states there is a correlation between the CAR and the ROE on the one hand and a correlation between the NPLR and the ROE on the other hand. This means that the variables because and NPLR influence the ROE.

However, LNTA is not significant given the results of the analysis of regression 0.2291, so we cannot reject the null hypothesis.

Hypothesis 2 is about the correlation between CAR and NPLR and ROA of commercial banks.

Hypothesis 2 The second regression analysis was performed to test for the second hypothesis:

$ROA_t=\beta 0+\beta_1 CAR_t+\beta_2 NPLR_t+\beta_3 LNTA_t$

Variables	Coef.	Std.Error	T	P-value	R^2
Constant	0.104127	0.049410	2.107401	0.0457	0.447508
CAR	0.094782	0.040491	2.340804	0.0279	
NPLR	-0.082231	0.034771	-2.364922	0.0265	
LNTA	-0.005695	0.002654	-2.146106	0.0422	

Table 4 Regression 2

The second regression analysis shows that the p-value for CAR is 0.0279 and for NPLR is 0.0265. Under the condition that the level of significance is 5 percent, a p-value less than the 5 percent should be required to reject hull hypothesis. Concerning the results, the null assumptions are to be rejected. We accept the alternative hypotheses, which state there is a correlation between the CAR and the ROA on the one hand and a correlation between the NPLR and the ROA on the other hand. This means that the variables because and NPLR influence the ROA.

Besides, the p-value of LNTA is less than 0.05 (0.0422), which demonstrates that the relationship between bank size and ROA is significant.

DISCUSSION

Correlation Results Findings

The relationships among the study variables depicted in the model were tested using correlation with ROE and ROA separately with determinants of the bank's profitability ratio, which is presented in Tables 4 and 5, respectively. Results show that ROE is positively correlated with CAR (0.297956), which means that one percent increase in CAR increases ROE by 0.297956; this result is similar to the studies conducted by Naceur and Kandil (2009) and Hyun & Rhee (2011). In other hand, ROE is negatively correlated with NPLR (-0.213146) and LNTA (- 0.020323). That means an increase of 1 percent in NPLR will result in a decrease in ROE by 0.213146. It is similar to the findings of KOLAPO, T.F., R.K. AYENI, & M.O. OKE. (2012), Gopalakrishnan (2004), and Ruziqa (2013).

The results of the ROA analysis also demonstrate on this side that the CAR is positively correlated (0.269010), which means that one percent increase in CAR increases ROE by 0.269010. In contrast, NPLR is negatively correlated with ROA, (- 0.138928). That means an increase of 1 percent in NPLR will result in a decrease in ROA by 0.13892.

Regression Results Findings

The regression results for the commercial banks are presented in Tables 3 and 4. In the first one (Table 3 for ROE), the value of R-square is 0.555, which means that 55% of the total variation in the value of ROE was due to the effect of the independent variables. The adjusted R square was 0.44. This shows that on an adjusted basis, the independent variables were collectively 44% related to the dependent variable ROE. The R square for ROE (0.555) was determined higher than ROA (0.447), suggesting the model framework appears to influence ROE better than ROA.

Implication to Research and Practice

According to the strategic role of the banking sector in the economy, Congolese authorities must be more decisive regarding financial sector reforms However, further progress on financial sector reform is necessary to allow banks to fully play their role in increasing economic efficiency and growth, and in helping the DRC realize its economic potential and work towards integrating the multilateral trading system This study makes a modest contribution to understanding a facet of the banking universe where empirical studies address this theme It adds to the numerous empirical studies on determinants of banking performance in the Congolese context.

As per the current study's findings and conclusions, the researchers recommend that banks should monitor and conduct deep analyses of all loans and advances applications including the credit history before credit approvals are granted to applicants to reduce the non-performing loans to as low as possible in the future by focusing more and more on the ability of borrowers to pay back their loans. It is crucial to make this practice as a culture by banks to achieve higher profitability and enhance its risk management performance.

CONCLUSION

Concerning the first part of our objective in this study which was to determine the impact of capital adequacy ratio on performance by commercial banks in DR Congo, the study concluded that, at a 5% significance level, capital adequacy ratio has a statistically significant effect on commercial banks performance in Democratic Republic of Congo. For the second objective which was to determine the relationship between the non-performing loans ratio and performance of banks, the study also concluded that NPLR has a statistically significant effect on commercial banks.

However, we have remarked that there is a negative relationship between NPLR and ROE and ROA, and there is a positive relationship between the car and Roe and ROA. Many previous studies have found the same conclusions. The higher the NPLR is, the less capital available for the banks to invest.

The results of the study reveal that banks with high capital adequacy ratios can better advance more loans and absorb credit losses each time they face it, especially in the context of Congolese banks where the uncertainty of reimbursement is high and thus record better profitability.

We can conclude that the more risk management within commercial banks is efficient, the higher the profitability of banks.

Future Research

It is important to note that this study has some methodological and/or conceptual limitations. Although the sampled banks represent the majority of banks in the DRC, the availability of data limited the choices of variables and econometric analyses to be applied to this research. The results obtained offer opportunities for future research. The hope is that further research will take into account other profitability indicators. Indeed, the data used only take into account two indicators (ROE and ROA), the perception of other performance indicators could be different and lead to other much better results and consider a longer study period to better assess the data or study a larger number of banks operating in the Democratic Republic of Congo.

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