Credit Risk and Commercial Banks Performance in Tanzania: a Panel Data Analysis

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Abstract

The study was meant to find the relationship between the credit risk and bank performance as measured by return on asset. Regression model was used to develop the relationship between the indicators of credit risk and bank performance, the credit risk indicators have produced negative correlation which indicate the higher the credit risk the lower the bank performance. Regression model was statistically fit producing R square and adjusted R square of 70% and 64% respectively. The study recommends the bank understudy to increase the capital reserve to protect the bank for the future losses and to increase bank credit risk management techniques.

Keywords: credit risk, performance, regression.

1.0: INTRODUCTION

Commercial banks play an important role for economic development, and foster economic growth of any country through their intermediation role and financial services that they provide to community and nations. The credit facilities that they offer facilitate the exploration and expansion of productive investments avenues by individuals and institutional investors.

It is evident that the efficient and effective performance of banking industry over time guarantees financial stability of any nation (Oke et al 2012). The health of financial sector depends chiefly on sound baking system. Failures in financial intermediation can disrupt the development process (Abhiman and Saibal, 2007).

Commercial banks` main profitable business among others is lending. It remains to be primary business of every commercial bank in the world, Dasah, etal, (2012), which is the source of net interest income. Granting credit is indeed one of the main sources of income, Hosnaetal, (2009), Bashir, (2000) and Fries *et al*., 2002: 10); hence large credit portfolio ought to mean improved profitability of commercial banks (Aburime, undated).

The credit quality is considered a proxy of operational performance and financial health of banks. The credit risk, which is a possibility that borrowers will not repay their debts on time or not repay at all, Sinkey (2002), Coyle, (2000); a possibility of non-performing loan and default, a risk that assets and loans become irrecoverable as Dasah, etal, 2012, and Heffernan (1996) put it, affects not only operational performance, profitability, or net interest income of banks but the economy as a whole. It is on this ground, Afriye and Akotey (2010) argue that a sound credit risk management is critical for the survival and growth of commercial banks.

While various studies (Hosna, etal, 2009; Oke et al, 2012; Dasah et al, 2012; Kargi, 2011; kithunji, 2010 and Ahmed, Takeda and Shawon, 1998) have been conducted in the past in relation to credit risk[3] (credit risk management) and performance in commercial banks in Africa and in developed countries, the result is still mixed, and none has been conducted in Tanzania; this is our point of entry on this paper.

This paper conducts a panel data analysis that gives careful attention to the impact of credit risk level on the commercial bank's profitability in Tanzania, thence adds on the stock on the invariably available findings on the matter.

2.0: LIRETERTURE REVIEW-

2.1: Theoretical foundation of the paper

This part of the paper takes a closer look on theoretical foundations and contributions on the subject matter. A bank exist to perform a number of functions chiefly, accepting deposits and granting credits (loans and advances) categorically provided as primary or banking functions; in fact banking means accepting for the purpose of lending of investment of deposits of money from the public. Secondary functions include agency and utility functions[4].

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[3] According to Samad (2012), credit risk is a major risk for a banks and mainly a function of the quality of a bank's loans. It is an internal factor, amenable to bank management. Credit risk is measured by several ratios. They include (i) net charge off to loans, (ii) credit loss provision to net charge off (iii) loss allowance to loans (iv) loan loss allowance to non-current loans, and (v) non-current loans to loans.

[4] http://kalyan-city.blogspot.com/2011/04/functions-of-banks-important-banking.html

Granting of credit facilities by commercial banks which is the primary function as pointed out earlier, expose them to credit risk[5]. Credit risk is the risk of default[6] by counterparty to a loan transaction and is different from market risk (Srivastava, 2010:507). Credit risk is by far the most significant risk faced by banks and the performance, survival and sustainability of their business depends on accurate measurement, sound and effective management of this risk relative to any other risks (Afriye and Akotey,2010; Oke, et al 2012)[7]. Credit risk is perhaps most significant of all risks in terms of size of potential losses and can be divided into; default risk, exposure risk and recovery risk (Hosna, et al 2009).

According to Basel Accord (2006); *Credit risk is the risk of loss due to an obligator's non-payment of an obligation in terms of a loan or other lines of credit*. Chen and Pan (2012), define credit risk as the degree of value fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties. It is losses from the refusal or inability of credit customers to pay what is owed in full and on time (Coyle 2000). It is a possible loss to a commercial bank due to failures on the part of bank borrowers (counterparties) to repay the loaned amount on time, or the amount becomes completely irrecoverable. It is failure of borrowers to meet their financial commitments with banks in accordance to agreed terms and conditions.

The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters (as per entity`s risk appetite) which is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organisation.[8] Due to the increasing spate of non-performing loans (Oke, et al,2012); the Basel II Accord emphasized on credit risk management practices; compliance with which ensures sound approach to mitigating credit risk consequently achieving improved commercial banks profitability.

2.1.1: Sources and determinants of credit risk in Banks:
The likelihood that the borrowed amount (principal & interest) will not be repaid as per underlying agreements entail credit risk which is dependent on, among others the bank`s loan portfolio and the behavior of the customers/borrowers. It is arguably provided (see for example), that the higher the Bank`s loan portfolio the higher the interest income, which inevitably calls for high credit risk.

As pointed out earlier on, the largest and most obvious and critical source of credit risk for most commercial banks are loans and advances. However, other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet.

"Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions".

It is worth noting that credit risk is also linked with other risks likely to affect the activities of the banks (for example, fluctuating interest rates and other possibly related variables). Credit risk, however, can be a function of other factors such as insufficient knowledge on financial risks and especially credit risk at institution level; lack of appropriate and effectively implantable credit policies, inadequate capital level and unstable liquidity status, laxity in credit assessment, and poor lending practices and procedures. Furthermore, Kithuri (2010), points out government interference and inadequate supervision by the central bank and direct lending as other sources of credit risk. Persisting credit risk gradually impacts liquidity and solvency of banks and may consequently lead to a total a failure.

Abhimal and Saibal (2007), Gabriel et al (2006); Samad (2012) and Ahmad and Ariff (2007); in their academic works, pointed out a number of determinants of credit risk in banks; First, inefficient banks performing poor screening and monitoring of borrowers will tend to have inferior portfolio[9], Second; Collateralized loans have a high possibility of default because banks tend to trust the borrowers with secured loans and hence less incentives

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[5]Credit risk is perhaps the most significant of all risks in terms of size of potential losses. Credit risk can be divided into three risks: default risk, exposure risk and recovery risk. As the extension of credit has always been at the core of banking operation, the focus of banks' risk management has been credit risk management (Hosna et al (2009).

[6]The customer may default because of temporary financial distress, near insolvency, bankruptcy or outright liquidation.

[7] According to the Basel Accords, risks the banks facing contain credit risk, market risk and operational risk. Basel II (2006): International Convergence of Capital Measurement and Capital Standards, A Revised Framework Comprehensive Version.

[8]http://www.bis.org/publ/bcbs54.htm: Accessed on 20.04.2013

[9] Caused by among others, stiff competition among banks and other financial institutions forces the banks to sacrifice objectivity in credit evaluation standards to compensate for declining profitability (Abhiman and Saibal, 2007)

to undertake adequate screening and credit assessment[10] ; third; Rapid loan growth or credit expansion (over extension of credit) and extended passage of time for profit maximization leads to poor loan quality.

Fourth, economic down turn[11] (recession) as external factor affects the ability of individuals, institutions and other borrowers` ability to repay their debts thence high possibility of failure to fulfill their financial commitments.

2.1.2: Credit risk mitigation and management techniques:

Risk management is critical to every business and especially to banks whose stock is cash. The main profitable activity of the bank is lending money. It is therefore, inevitably not possible to separate banking with credit risk management; which has to be a continuous process and implemented wherever, banking business exist. The main banking business is lending and so the underlying principle of lending is risk mitigation, which goes with determining a borrower's ability and propensity to repay the loaned amount[12]. Credit risk management starts with assessing the likelihood of credit risk; determining this risk involves reviewing the borrower's past credit history and earned income. Someone with a good credit rating poses less of a risk than someone with a poor credit history[13].

Effective credit-risk management requires financial managers or risk manager as appropriate as it may be, to have in depth understanding of the corporate financial risks and how they interrelate with credit risk. This demands analysis of the business environment in which the bank operate and the assessment of the credit risk in terms of likelihood and impact on the entity`s loan portfolio and profitability.

The assessment avails important information to banks necessary to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred.

Risk management should be a proactively adopted and continuous process and procedures, that enable the banks review, study and analyse the financial health and liquidity status of borrowers, assess counterparties' solvency and advance funds adeptly

The credit risk management strategies are measures employed by banks to avoid or minimize the adverse effect of credit risk. A sound credit risk management framework is crucial for banks so as to enhance profitability guarantee survival of banks (Oke, et al, 2012). The following are the ways/ strategies which can be employed by the banks to mitigate the credit risk; they are two folds, derivative tools and non-derivative ways.

Firstly; adequately monitoring corporate credit risk is an important practice. It is focusing on effective counterparty continuous monitoring which is a key tool that sets thriving companies apart from financially struggling firms[14].

Secondly, according to Basel Committee on Banking Supervision (2009)[15], the sound practices are also necessary for credit risk management. It set out the practices such as establishing an appropriate credit risk environment; operating under a sound credit-granting process; maintaining an appropriate credit administration, measurement and monitoring process; and ensuring adequate controls over credit risk. These practices should also be applied in conjunction with sound practices related to the assessment of asset quality, the adequacy of provisions and reserves, and the disclosure of credit risk.

Thirdly; Compliance to Basel Accord- the Basel Accord are international principles and regulations guiding the operations of banks to ensure soundness and stability. The Accord was introduced in 1988 in Switzerland. Compliance with the Accord means being able to identify, generate, track and report on risk-related data in an integrated manner, with full auditability and transparency and creates the opportunity to improve the risk management processes of banks (Oke, et al.., 2012).

Insurance against credit risk i.e. Transfer of risk (commonly called securitization) is another way to manage credit risk. It is the transfer of credit risk to a factor or insurance firm and this relieves the bank from monitoring the borrower and fear of the hazardous effect of classified assets. This approach insures the lending activity of banks (Oke, et al, 2012). A collateralized loan obligations secured on cash or asset is a also form of securitization in which assets (bank loans) are removed from a bank's balance sheet and packaged (tranched) into marketable securities that are sold on to investors via a special purpose vehicle (SPV) (Marsh,2008)[16].

Thirdly; Credit Derivatives are instruments that provide hedge against credit risk. They cover default risk or

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[10]Saurina, 2004, as quoted in Abhimal and Saibal, 2007 and Kraft and Jankov,2005, as quoted in Ahmad & ariff,2007

[11] Ahmad and Ariff (2007) considers it as a significant determinant of credit risk

[12] Available on: http://www.ehow.com/about_5108660_credit-risk-management.html- Accessed on 22.04.2013

[13] Read more: Credit Risk Management in Banking | eHow.comhttp://www.ehow.com/facts_6145446_credit-risk-management-banking.html#ixzz2RMUOy7ae

[14] By Edward I. Altman, finance lecturer at New York University's Stern School of Business.

[15] Principles for the Management of Credit Risk - consultative document- Available online at bank of international settlement

[16] As quoted in Oke, et al (2012)

credit-related return performance (Srivastava, 2010:508). This instrument provides banks with an approach which does not require them to adjust their loan portfolio (Oke, et al, 2012). Credit derivatives provide banks with yields to compensate for the credit risk. It facilitates the segregation of returns of an asset, such as loan or bond, into normal returns on investment (Srivastava, 2010). The only instrument whose payoff is purely governed by events signifying the credit risk is credit default swap whereby a seller agrees to shift the credit risk of a loan to the protection buyer. Recent innovations in credit derivatives markets have improved lenders' abilities to transfer credit risk to other institutions while maintaining relationship with borrowers (Marsh, 2008).

Moreover; the adoption of a sound internal lending policy[17] which guides banks in disbursing loans to customers is an important way for credit risk management[18]. The strict adherence to the lending policy (procedures and principles in conjunction with overall banking business strategy) reduces the possibility of poor quality loan portfolios and hence minimizes the effect of credit risk.

Lastly the use of credit agency (Credit Bureau as Oke, et al, 2012, put it), plays an important role in credit management; it is an institution which collects and compiles information regarding borrowers profile and financial status history (necessary to assess credit worthiness) and sell this information to banks. These institutions awards credit score called statistical odd to the borrower which makes it easy for banks to make instantaneous lending decision[19]. In general the commercial banks should have in place a credit risk management frame work, and ensure its effective implementation by defining the role of each responsible personnel.

2.2: A review of related empirical literature:

Credit risk is associated with the bank`s major business of lending, it is therefore a serious threat/danger to commercial bank`s profitability. In this regard various researchers have examined the impact/relationship of credit risk with diverse variables/aspects of banks. This part of the paper provides related empirical findings on the subject matter.

Various empirical findings, both from developed and developing has recorded mixed results. A number of researches[20] have noted a negative quantitative relationship between either credit risk or credit risk management and profitability/performance in commercial banks. While some found the positive relationship. Hosna, et al, (2009), for example; assessed the effect credit risk management and profitability in commercial banks in Sweden. Using two credit risk indicators (NPLR and ROE), the findings and analysis revealed that credit risk management has effect on profitability in all 4 banks selected.

Dasah, et al (2012) found a positive relationship between credit risk and profitability in Ghanaian commercial banks. The result is consistent to that of Afriyie and Okotey (2010), who found a significant positive relationship between non performing laons with profitability of rural and community banks in Ghana. The study by Achou and Tegnuh (2008); indicated that effective credit risk management leads to better bank performance. The result of the study by Achou and tegnuh (2008) is supported by the study by Hosna et al (2009) in Sweden and Flamini et al (2009) in Sub-Saharan Africa commercial banks.

Ahmad and Ariff (2007) examined the key determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. The study highlighted that credit risk in emerging economy banks is higher than that in developed economies.

It is evident from empirical literature that, the results of studies on credit risk and profitability is still mixed and only limited number has been conducted in African commercial banks. This study aims to add value into the available stock, and applies the panel data analysis method, similar to that used by Okel et al (2012), Dasah et al (2012) and Uburime (undated).

3.0: METHODOLOGY OF THE STUDY:

The study employed the panel data from the 11 banks in Tanzania. The main sources were published financial statements from the banks. Casual research design and descriptive research design was employed as the study was keen to establish the relationship between the variables. The econometrics test such as VIF (Variance Inflation Factor) and DW (Durbin Watson) was adopted.

Since the study seeks to establish the relationship, regression analysis was adopted to identify the causality of the sample.

3.1: Specifications of the regression variable

The dependent variable of the sample is return on asset (ROA) which measure how the banks are profitable

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[17] The existing credit policy should be in line with industry norms, general economic conditions of the country and the prevailing economic climate (Kithinji, 2010).

[18] Oke, et al (2012)

[19] ibid

[20] The researches include the followings; Oke, et al, (2012); kargi, (2011); kithunji, (2010); Ahmed, et al, (1998); Felix and Claudine (2008)

relatively to their assets and how the management is efficient in utilizing the company assets to generate profit. The independent variables are loan loss to gross loan, Non-Performing loan, loan loss to net loan, impaired loan to gross loan. The control variables are deposit and bank size. The deposit is used because the loan issuance depends on the deposit level of the bank. Bank size classify between the large and small banks, which one is vulnerably to higher credit risk

Impaired loan measure the portion amount of loan that will not be recovered from the individual

$$y = \propto + \beta 1 x 1 + \beta 2 x 2 + \beta 3 x 3 + \beta 4 x 4 + \beta 5 x 5 + \beta 6 x 6 + \gamma 1 d 1 + \gamma 2 d 2 + \mu \ldots \ldots \ldots \ldots \ldots i$$

With the above equation the dependent variable is ROA (Y) and the remaining are the coefficients independent variables $\beta 1$, $\beta 2$, $\beta 3, \beta 4$, $\beta 5, \beta 6$ and $\gamma 1, \gamma 2$ are the coefficients of the control variables.

4.0: FINDINGS

4.1: Descriptive statistics

Table 1: Shows the summary of minimum, maximum, standard deviation and mean of the variable used

Table 1

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Year		2005	2011	2008.00	2.008
Loan loss/grsl	133	-.552	97.327	4.70717	8.963939
Loanlss/netrev	133	-21.135	114.371	15.11688	18.972893
Loanrs/im	133	-8.961	795.581	67.34568	100.725631
Imparel/grl	133	-93.882	38.198	5.20953	11.555035
NPl	133	.0000	12.6706	1.059602	1.6479138
NPCC	133	.0280	1.1345	.548538	.2431440
In deposit	133	18.091363749422	28.210643995753	25.56162647530869	1.579072213538388
ROA	133	-5.96	9.40	1.8726	2.13619
ROE	133	-39.976	51.633	15.81568	16.144939
Size	133	0	1	.53	.501
NIM	133	1.919	13.507	6.85523	2.544801
Valid N (list wise)	133				

4.2: Correlation

Table 2 indicates the Pearson correlation, the lower level of correlation coefficients among the variable is the sign of the absence of inter relationship among the independent variables. The greater the correlation among the individual independent variables is the sign of multicollinearity therefore the data has proved to have no multicollinearity in the sample. Hence the independent variables have greater predicting power

Table 2

Correlations								
Control Variables			loan loss/grsl	Loanrs/impaired	imparel/grl	NPl	NPCC	ROA
in deposit	loan loss/grsl	Correlation	1.000	-.025	.023	-.076	-.074	-.405
		Significance (2-tailed)	.	.77	.796	.384	.398	.000
		Df	0	130	130	130	130	130
	loanrs/im	Correlation	-.025	1.000	-.001	-.039	-.100	-.062
		Significance (2-tailed)	.774	.	.991	.655	.254	.483
		Df	130	0	130	130	130	130
	imparel/grl	Correlation	.023	-.001	1.000	.027	-.105	.019
		Significance (2-tailed)	.796	.991	.	.760	.230	.826
		Df	130	130	0	130	130	130
	NPl	Correlation	-.076	-.039	.027	1.000	-.026	-.082
		Significance (2-tailed)	.384	.655	.760	.	.768	.348
		Df	130	130	130	0	130	130
	NPCC	Correlation	-.074	-.100	-.105	-.026	1.000	.130
		Significance (2-tailed)	.398	.254	.230	.768	.	.138
		Df	130	130	130	130	0	130
	ROA	Correlation	-.405	-.062	.019	-.082	.130	1.000
		Significance (2-tailed)	.000	.483	.826	.348	.138	.
		Df	130	130	130	130	130	0

4.3: Analysis of regression results

4.3.1: Model fit

The regression results indicate the existence of the relationship between the dependent and independent variables hence has the ability to predict the influence of credit risks on the profitability of the bank. The model is well fitted with 70% ability to influence the performance of the bank while the adjusted R square is 64%. With reasonable judgments of R square and adjusted R square of above 50% have greater ability to influence the dependent variablesEconometric test of autocorrelation Durbin Watson approaches to zero which inform the absence of autocorrelation in the sample.

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.838[a]	.702	.640	1.74891	1.979
a. Predictors: (Constant), size, NPl, NPCC, loan loss/grsl, loanrs/im, imparel/grl, loanlss/netrev, in deposit					
b. Dependent Variable: ROA					

The model was statistically significance at 5% level since the F statistics has been 0.000 which postulate the model to be significance.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	423.079	8	27.885	9.117	.000[b]
	Residual	179.276	124	3.059		
	Total	602.355	132			
a. Dependent Variable: ROA						
b. Predictors: (Constant), size, NPl, NPCC, loan loss/grsl, loanrs/im, imparel/grl, loanlss/netrev, in deposit						

4.3.2: Coefficients and significance level of the variable used

Loan losses to gross loan, loan loss to net income and Non-performing loan have been significance at 5% level. The analysis entails significance of variables in influencing the bank performance as measured by profitability because their P values were less than 5%. The constant variable is also significance at 5% level; the constant

variable is the measure of dependent variables in the absence of individual independent variables, therefore in the absence of credit risk measure identified earlier it means the other factors can increase profit by 5.792

Loan loss to gross loan, loan loss to net income and Non-performing loan negatively affect the profitability of the banks because of the negative coefficients, for every 1% increase in loan loss to gross loan, loan loss to net income and non-performing loan tends to lower the profitability level by 27.1%, 42.7% and 13.1% respectively.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.792	2.729		2.122	.036
	loan loss/grsl	-.065	.018	-.271	-3.492	.001
	loanlss/netrev	-.048	.009	-.427	-5.399	.000
	loanrs/im	-.002	.002	-.084	-1.161	.248
	imparel/grl	.005	.013	.028	.388	.699
	NPl	-.170	.044	-.131	-3.830	.001
	NPCC	.651	.643	.074	1.012	.314
	in deposit	-.139	.109	-.103	-1.277	.204
	Size	1.118	.347	.262	3.221	.002

5.0: CONCLUSION

Conclusively it has been witnessed that the increase in credit risk tends to lower firm performance, both indicators have produced the negative coefficients which tends to lower profit level. Credit risk is not a bad situation as it is related to bank return, from empirical theory it has been stated that the higher the risk the higher the bank return due to the bank ability to increase portfolio, but the bank need to balance and foresee the return. With these the bank need to maintain substantial amount of capital reserve to absorb credit risk in event of failure, moreover the bank need to enhance lending criteria, portfolio grading and credit mitigation techniques to reduce chance of default. Meanwhile the adoption of sound management practices and corporate governance will reduce credit risk,

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