Risk Management and Return on Equity: An Estimated Model of Micro-credit Institutions From Nigeria

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ABSTRACT
Credit creation is the main income generating activity of banks. The loan portfolio is typically the largest asset and the predominate source of revenue of banks. Inadequate policies for risk management impair bank profitability and its long-term operation. This study examined the relationship between risk management and return on equity of quoted microcredit institutions in Nigeria. The objective was to examine the nature of relationship between risk management and return on equity of microcredit institutions. Cross-sectional data was source from financial statement of 14 microcredit institutions listed on the floor of Nigeria Stock Exchange. Return on equity was the dependent variable while the independent variables are loan loss provision, credit limit, credit evaluation and credit diversification. R-square, regression co-efficient, Durbin Watson statistics, F-probability and T-statistics was used to examine the extent to which credit management affect return on equity of the microcredit institutions. Findings from fixed effect model indicate that 87 percent variation on return on equity of the microcredit institutions were traced to variation on risk management indicators. The regression co-efficient prove that loan loss provision and credit diversification have negative and significant effect on return on equity while credit evaluation and credit limit have positive and significant effect on return on investment. From the findings the study concludes that credit management has moderate effect on the return on equity on the microcredit institutions. We recommend that the microcredit institutions should strictly comply on credit policies and the credit department should enhance it ability in credit appraising and evaluation to avoid the negative effect of credit risk on profitability of microcredit institutions in Nigeria.
Keywords: Risk Management, Return on Equity, Micro-credit institutions, Nigeria

INTRODUCTION
The main premise in finance is that there is a connection between risk and return. Higher risk is assumed to lead to higher return on stocks with rationale pricing of stocks. Highly profitable firms are riskier than the average (Fama and French, 2015). Finance theories suggest that there is a positive relationship between risk and returns. However, it is also possible that high risk leads to financial distress which can result in lower future profitability. Conceptually, risk is the probability of loss or failure. In finance the concept of risk relate to variability of earnings. Risk is inherent in every business, but organization that have the right risk management strategies into business planning and performance management are more likely to achieve their strategies and operational objectives. Risk takes many forms, each affecting the agents economic activity on a lesser or greater extent. It comprises financial risk and operating risk. Financial risk emerges from the financing of corporate entities such as leverage while operating risk emerges from the operation of a firm. Management of risk is an integrated part of planning and financial control submitted to strategic and tactical decisions for a continuous adaptation to inside and outside company conditions constantly changing.

Microcredit institutions risk is determined by the fact that microcredit institutions services and products are targeted to the poor and low income earners in the society. Most clients of microcredit institutions do not have physical assets (house, land, automobile, plant and machinery) and financial assets (share, bond, stock and debenture certificates) to pledge as collateral for loans and advances collected. There is no supportive regulatory and supervisory policy framework on the part of some government which led to physical and economic challenges for microcredit institutions, where

regulatory framework exists. The peculiarity of microfinance banks business in most cases is not taken into consideration, microcredit institutions and other banks are regulated under the same policy and the ownership structure of microfinance banks is dominated by donors in many countries instead of private investors as owners (Guo, Zhang, Zhang & Zhang, 2017).

Taking risk is core to the banks business and risks are inevitable consequences of being in business. The banks aim is therefore to achieve an appropriate balance between risk and return and maximize potential adverse effects on its performance. Risk management among firms has been inadequate procedure to monitor and regulate risks. Risk management is an issue that needs to be stressed and investigated, especially in the banking industry where the needs for good risk management structure are extremely important.

A number of studies have been done locally and internationally in relation to credit risk management and loan performance. Washington and Walsh (2010) carried out an assessment of the credit management process of credit unions. The study found that credit unions are deficient in the credit control department. A study conducted Ahmed & Malik (2015) on credit risk, Credit Assessment, Basel III, Small Business Finance in small and large banks in Sweden found out that most banks had a well-developed credit process where building a mutual trust relationship with the customer is crucial. A study by Iqbal and Mirakhor (2007) found out that strong risk management practices can help microcredit institutions reduce their exposure to credit risk and enhance their ability to compete well in the industry.

Simiyu (2008) established that majority of the institutions used credit metrix to measure the credit migration and default risk. The findings showed that the microfinance institutions are faced with the challenge of strict operational regulations from the Central Bank of Kenya. Chege (2010) concluded that credit risk management practices enhance profitability of the MFI. Kombo et al., (2010) asserted that strategic risk, credit risk and liquidity risk are the most frequent risks; whereas reputation and subsidy dependence risks occur at a very low incidence for Micro Finance Institutions (MFIs) located in Kiplimo & Kalio (2012) established that there was a strong relationship between client appraisals and loan performance in MFIs.

Mwithi (2012) found that there was a positive correlation between credit risk assessment and management of microfinance institutions in Nyeri County. Kisala (2014) in his study found a significant relationship between loan performance and credit risk management in MFIs in Nairobi, Kenya. Further, a study by Kipkemboi (2013) revealed a positive relationship between credit risk management practices and financial performance of microcredit institutions. Njenga (2014) denoted a positive relationship between the variables under study in her determination on the effect of credit management practices on loan performance in deposit taking microcredit institutions in Kenya.

Otieno and Nyagol (2016) concluded the existence of a significant relationship between credit risk management and financial performance of microcredit institutions. However, these studies do not cover credit risk management and loan performance in microcredit institutions in Kenya. These credit risk management aspects include credit risk environment, credit appraisal process, credit administration, measurement and monitoring and internal controls. The above studies are foreign and there is no known study in Nigeria on the effect of risk management on the profitability of microcredit institutions. Similar studies in Nigeria focused on the commercial banks therefore, this study wants to examine the effect of risk management on return on equity of microcredit institutions in Nigeria.

LITERATURE REVIEW
Risk Management
Risk management is a term that is synonymous to different area of human endeavours. Risk management was defined by Abdel-Khalik (1993) as the planning and controlling of all the conceivable elements of risks which are inherent in the daily operations of an organization in order to ensure the organization's continued existence as well as the realization of its set goals and objectives. Addae-Korankye (2014) opined that in managing risk, banks must decide which risks to take, which to transfer and which to avoid.

Risk need to be managed in microcredit institutions to avoid mishaps, hardship and loss of financial and human assets and to guarantee continuous supply of loanable fund to the end user as at when needed. According to Olfield and Santomew (1997), it has been argued that risk is an essential ingredient in the financial sector and that some of this risk will be borne by all but the most

transparent and passive institutions. In short, active risk management has a place in most financial firms.

Risk management is an integral part of monitoring and evaluating both liquid and illiquid assets and depositors liabilities of microcredit institutions to ensure the sustainability of the industry. It should be understood from the outset that risk cannot be managed in any microcredit institutions if the management did not set a goal in that direction. Therefore, the first thing to be done is that there must be a written goal and drive from the owners and managers as to the need to manage risk on daily basis before they arise and/or as they become known (Ekka, Chaundry & Sinha, 2011). Furthermore, the management should put in place a risk management policy and procedures covering all areas of their microfinance business, including those areas they microcredit institutions intend to venture into in the nearest future. The policy should be followed in managing risks as they are identified in the industry or in their own location, but not necessarily until it affect the business negatively.

Credit Risk Management Practices

Credit risk management is defined as the systems, controls and procedures, which are set by companies to ensure efficient payment collection from clients thereby minimizing potential of non-payment (Kalui & Kiawa, 2015). Credit risk Management policies include decision-making structures that are meant to reduce exposures on the credit asset classification and provisioning of loan losses (Tanui, Wanyoike & Ngahu, 2015). Credit risk management is a great issue that many financial organizations are concerned about. As such, the need to develop well improved systems and processes that can deliver better future performance visibility is highly required by these financial organizations (Gakure, Ngugi, Ndwiga & Waithaka, 2012). Credit risk management involves identifying, measuring, mitigating, monitoring and controlling of all exposures of credit risk (Raad, 2015).

The first stage of credit risk management process is risk identification (Ngwa, 2010). The process of identifying hazardous or dangerous situations and trying to characterize it is the process of risk identification. It is a procedure to deliberately examine, review and anticipate possible risks (Kimotho & Gekara, 2016). Identification of risk identification is all about analysis of the present and the future risks of a firm in a more comprehensive manner in all areas of a business such as asset management operations and so on (Ngwa, 2010). To effectively manage credit risks, commercial bank's manager's need to know the kind of risks that are likely to face the bank. Most importantly, the managers should ensure that they do not miss any risk during risk identification stage and this can be done through establishing an appropriate credit risk environment (Mutua, 2015).

Credit risk analysis involves examining the creditworthiness of a member-borrower. This comprises an analysis or examination of sources of repayment as well as credit history of the member-borrower (Lagat, Mugo & Otuya, 2013). Credit appraisal and analysis is about client screening so as to ensure that not only have ability but also the willingness to repay a loan on time (Kurui & Kalio, 2014). Credit risk analysis provides a greater understanding of risk and is important to the organization as it helps in making risk-based and assists organizations to make a comparison of risks, which in the long run help organizations to make prioritize on risk events (Kimoi, Ayuma & Kirui, 2016). The aim of credit risk analysis is to identify and weigh all the events that may prevent the repayment of a credit in the future and by implication the capacity of the borrower to repay the facility (Ngwa, 2010).

Risk control or mitigation entails established systems and procedures that are used to reduce and inhibit the existence of credit risk associated with loan exposures. Risk control gives protection to an exposure, which the bank continues to hold (Lagat, Mugo & Otuya, 2013). Risk control or mitigation is about using the physical standards, tools, training staff, techniques to either prevent or reduce or eliminate the perceived consequences or threat of risks (Ngwa, 2010). The last stage of a risk management process is monitoring. Credit risk monitoring involves defining the guidelines for recognizing and reporting probable shortcomings of credits and other transactions to ensure that they are closely monitored, corrected and provisioned (Makori, 2015). Monitoring involves creation of a constant contact with clients. This is meant to color the bank as a trusted adviser and problem solver (Mutua, 2015).

Microcredit Institutions

According to Asian Development Bank (2000) microfinance is the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and their micro enterprises. Microfinance services are provided by three types of sources: formal institutions, such as rural banks and cooperatives; semiformal institutions,

such as non-governmental organizations; and informal sources such as money lenders and shopkeepers. Institutional microcredit is defined to include microfinance services provided by both formal and semi-formal institutions. Microcredit institutions are defined as institutions whose major business is the provision of microfinance services.

Otero and Rhyne (1994) defines microcredit institutions as a revolution that involves the large scale provision of small loans and deposit services to low-income people by secure, conveniently located and competing commercial financial institutions thereby generating the process needed to democratize capital. This definition means that the numbers of microfinance institutions should be enough to meet the needs of low income earners in the nation through the provision of loan facilities and to give room for healthy competition among them.

Robinson (2001) described microfinance as small-scale financial services-primarily credit and savings-provided to people who farm or fish or herd; who operate small enterprises or micro enterprises where goods are produced, recycled, repaired or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and groups at the local levels of developing countries both rural and urban. This definition is encompassing as it tries to state those who may benefit from microfinance institutions and also inform that developing countries need microfinance institutions more than developed countries and especially, that microfinance is meant for those operating small and micro enterprises. Microcredit institutions have been described as an economic development approach intended to benefit low-income women and men (Ledgerwood, 2000).

It means that the purpose of microcredit institutions is to reach the low income earners either in the urban or rural areas with financial services that will enable them create wealth without any discrepancy as to the sex of such person. Ndiaye (2005) opined that access to improved financial services – access to more and better ways of turning savings into lump sums – helps poor people from sliding deeper into poverty and helps them lay foundations for their ambitions to better themselves and their families. Microcredit is about providing financial services to the poor who are traditionally not served by the conventional financial institutions.

Three features distinguish microfinance from other formal financial products. These are:

   (i) the smallness of loans advanced and or savings collected
   (ii) the absence of asset-based collateral, and
   (iii) Simplicity of operations. Central Bank of Nigeria (2005). This give a clue that the CBN is aware that there are people that are not served by the conventional banks because the loan requires by them is very small compare to the activities and loan portfolio of these banks. Microfinance institution is now a growing phenomenon all over the world. It is emerging as a rapidly growing financial services industry worldwide as a solution to the crippling effects of the conventional banks interest on the poor and those operating micro and small scale enterprises (MSSE). microcredit can therefore be define as an economic approach to take financial services to those that are hitherto un-reached at a reasonable fee that is affordable and economic to the users of such services, and also, using funds from the providers of financial services to generate adequate returns for the users, thereby building up their enterprises and creating employment opportunities which will reduce the poverty level in the economy. Microcredit is a holistic approach that has been used in different countries to alleviate the plight of MSSE both in the rural and urban areas in accessing fund as at when required which was not possible from the conventional banks.

Major Risks in Microcredit Institutions

Berenbach and Churchill (1997) and Ledgerwood (2000) identified four main areas of risks that are peculiar to MFI as: Portfolio risk, Ownership and governance risk, Management risk and new industry risk. Adewunmi (2005) recognized risks like: Credit risk, Operational risk, Interest rate risk and Liquidity risk as those affecting financial institutions. However, this paper is of the opinion that Liquidity risk, Credit risk, Foreign exchange risk, Ownership return risk and Operational risk are those that affect microcredit institutions directly and they are discussed below.

Liquidity Risk

This is the risk associated with meeting regular and unplanned high withdrawals by large depositors who are always few in numbers. Some MFI get funds from mandatory legal deposit from banks and

government at different levels. For such microcredit institutions, a change of government or change in government policy may reduce available fund to MFI considerably, which possess liquidity risk to them. In Nigerian for example, the CBN encourage each state government to dedicate an amount of not less than 10% of their annual budget for on lending activities of microfinance banks in favour of their residents. Liquidity risk will also arise through donor fund which the donors might call back for some period or suspend forever. In such case, the financial base of such MFI will be threatened.

Credit Risk

Olfield and Santomew (1997) opined that credit risk arises from non-performance by a debtor. This can affect the lender who underwrote the contract, other lenders to the creditor, and the debtor's own shareholders. This is the risk associated with default in loan repayment as at when due or the uncertainty of meeting financial obligations by client at the right time.

This risk is pronounced in microcredit institutions as a result of inadequate collateral for loan disbursed if the borrower is unable to pay due to financial constraint and/or complete refusal to pay. Credit risk is not limited to unrepaid loans and advances alone, but extend to those loan applications that were turn down by microcredit institutions, because it may hinder their growth and cause reduction in size, earnings and profitability. It is apparent that microcredit institutions cannot boast of profit like the conventional banks. Where the owners of microcredit institutions are desirous of getting a sizeable return on their investment in a short time, which is common in a private ownership led businesses; this may lead to unhealthy practice in the operation and management of microcredit institutions so that appropriate return can be given to the owners. Actually, this risk is in force from the inception of microcredit institutions except the owners see their investment as part of their modest contribution in alleviating the plight of the poor at the short run before dividends could be declared. However, this is not the case because average investors want adequate return from the investment at shortest possible period, or else, the fund will be invested in another line of business with less risk and better return.

Operational Risk

Adewunmi (2015) defined operational risk as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. However, the operational risk of microcredit institutions essentially has to do with the employee who works in the organization. In most nations, banks' employee earns relatively more than many other sector of the economy. If employee of microcredit institutions see them self as banker and form their mind set, it will create a disorder and operational breakdown. It is expected that this will lead to agitation for better welfare package and may tend towards unionism which hamper the operation of microcredit institutions since they will found it difficult to pay similar remuneration like the conventional banks and other notable financial institutions.

Foreign Exchange Risk

Most microcredit institutions, especially those in developing countries source for funds from international organization/donor in foreign currency but lend such fund in their local currency. Despite lending in local currency, the repayment to the agencies/donors will always be in foreign currency. As a result of inconsistency in foreign exchange policy in most developing nations, at the time the loan is due for repayment, the exchange rate would have gone up, which will made it impossible for microcredit institutions to earn profit from the fund. Repayment may have to be met from another source which may wipe out depositors funds if adequate care is not taken.

Methods of Credit Management

Selection

According to Gestel et al. (2009) a sound credit risk management begins with a proper choosing of borrowers and the products that suit them. For this to be possible, a competent loan officers and Operative models of estimating risk should be in place. This is a very crucial stage because decisions are taken by the entire committee member. Here, borrowers that are likely to default are either denied or asked to secure the loan with more collateral to limit the effect of default.

Credit Limitation

Van-Gestel and Baesens, (2009) stated that this method aids the bank by reducing the amount of loss suffered from a borrower. It prevents the event where the failure of counterparty to meet his or her

obligation will heavily affect the financial performance of the bank. The number of riskier transactions is brought to the bearer minimal.

Credit Diversification

Here, banks should deal with different counterparties ranging from individuals, industries. This helps to spread the risk across various borrowers so that banks can reduce the impact of loss; it is much workable for large and international banks. That is, managing credit risk through risk diversification or spread (Van-Gestel & Baesens, 2009).

Compliance to Basel Accord

Basel committee on Banking Supervision enlarges the procedures through which a bank can manage its exposure to credit risk. One of the principles is constantly changing and reviewing their credit risk policies to suit the prevailing economic trend in the country. This can be done by the introduction of new products and services. Secondly, banks should investigate their borrowers properly. This will lead to a better understanding of the customer they are dealing with (Basel Committee on Banking Supervision, 1999). These strategies do not prevent credit risk totally; however they can reduce the level of credit risk the banks are exposure to. And this will increase the profitability performance of the banks. The Basel II is built on three pillars: 1.Minimum Capital requirement 2.Supervisory Review 3.Market Discipline Pillar 1 addresses the minimum capital requirement, that is, the rule which a bank calculates its regulatory capital. The minimum required capital ratio (8%) remained unchanged under Basel II while the way to calculate the risk-weighted-assets has been changed. As to the Pillar 2 of Basel II, it concerns with the supervisory review process and has been a supplement to the minimum capital requirement. Therefore, it requires a regular interaction between banks and supervisors in the assessment and planning of capital adequacy (Lind, 2005). The last pillar seeks to complement these activities through a stronger market discipline by disclosure of bank's key information of risk assessment procedures and capital adequacy (Ferguson, 2003). This, to some extent, could enable market participants to assess the bank's risk profile and level of capitalization.

Credit Evaluation

Credit evaluation is a loan function that is basic to minimizing loan loss. Through credit evaluation and/or analysis, the bank attempts to determine the ability of the borrower to repay the legitimate loans extended to him. By refusing the credit to a potential borrower whose analysis reveals insufficient financial strength, the bank hopes to improve on its chances to avoid unnecessary losses in its loan portfolio (Nwankwo, 1991). This is a very sensitive stage because it helps ensure loan quality. In simple terms, the giving of credit rest on the sureness the lender has in the borrower's ability to pay (credit worthiness). Credit worthiness is the ability and the readiness of a borrower to settle his or her debt. This is one of numerous issues which determine what should go into the credit policies of a lender. A lot of financial models come into play when assessing the credit worthiness of the deficit units. The most commonly used is the five financial analysis tools which include character, capital, capacity, condition and collateral. These tools are generally known as the 5cs of credit (Machiraju, 2004).

Loan Loss Provision

The guideline further states that licensed banks are required to make adequate provisions for perceived losses based on the credit portfolio classification system prescribed above in order to reflect their true financial condition. Two types of provisions (that is specified and general) are considered adequate to achieve this objective. Specific provisions are made on the basis of perceived risk of default on specific credit facilities while general provisions are made in recognition of the fact that even performing credit facility harbours some risk of loss no matter how small. Consequently, all licensed banks shall be required to make specific provisions for non-performing credits as directed by the regulatory authorities.

Return on equity

Return on equity (ROE) is a measure of the profitability of a business in relation to equity. ROE ratio essentially measures the rate of return that the owners of the common stock of a company receive on their shareholdings. It signifies how good the company is in generating returns on the investment it received from its shareholders. ROE is one of the all-time favorites and perhaps the most widely used overall measure of corporate financial performance (Rappaport, 1986). The ultimate purpose of any profit-seeking organization is to create wealth for its owners. According to Black (2001) shareholder

value is created when the equity returns of a company exceed the cost of that equity. It can also be described as the present value of all future cash flows, less the cost of debt. ROE is calculated by taking the profit after tax and preference dividends of a given year and dividing it by the book value of equity (ordinary shares) at the beginning of the year.

Theoretical Review
Credit Management Theory
Woolcock (2000) proposed the Credit management theory which states that the markets for credit or loans are highly shaped by the banks (who are lenders) strategies for potential borrowers screening and by addressing the opportunistic behavior which is encouraged by the nature of loan contracts. Accordingly, lenders usually increase credit pricing to a level that they expect returns to be maximized. This often excludes small, risky and costly borrowers. The consumption of credit tends to be inversely related to both the interest rates and the required collateral. Commercial banks tend to apply the credit management theory taking advantage of the opportunistic behavior presented by potential borrowers. Consumption of credit is collated to the collateral requirements and a variable interest rate pricing policy might be utilized by individual banks (Tanui, Wanyoike & Ngahu, 2015).

Theory of Information Asymmetry
Information asymmetry theory was proposed by Akerlof in 1970. Akerlof's (1970) argued that in markets, buyer usually use market statistic to determine the goods value. Therefore, the clients only see an average of an entire market whereas the seller uses a more intimate knowledge of a particular item. The argument put across by Akerlof is that information asymmetry gives the seller a great opportunity to sell his/her products or services of less than the average market quality (Parrenas, 2005). The average quality of a product or a service in a market will then decrease and so will the size of the market. There is available information for each agent. However, there is a strong information asymmetry between the managers and the investors of the firm (Akkizidis & Khandelwal, 2008). This theory explains a condition where all parties in an undertaking are not aware of the available relevant information (Eppy, 2005). Stiglitz and Weiss (1981) indicated that competitive behavior in such markets involves intertemporal linkages.

 The theory points out two problems associated with the perceived information asymmetry for to financial institution. That is the adverse selection and moral hazard. The theory affirms that, if commercial banks can exchange their client's information especially on clients' creditworthiness, which can lower loan repayment rate (Auronen, 2003). A reduction in information asymmetry between clients and lenders, credit reference bureaus will be able to develop credit risk management practices such credit rating and thus banks extend loans to creditworthy borrowers resulting in higher aggregate lending and low default rates.

The Adverse Selection Theory
 The adverse selection theory emanated from Stiglitz and Weiss (1981). Karlan and Zinman, (2004) noted that the adverse selection occurs when client's or borrowers of the bank have features or characteristics which are not observable by the bank when lending and these unobservable features have the potential of leading loan repayment default hence affecting the bank's profitability negatively. The theory assumes that: lenders will be unable to distinguish between banks loan clients of different risk degrees and that all the contracts of the bank loans offered to borrowers are all subject to a limited liability (Gladys, 2012).

The adverse selection theory describes the situation of a bank that cannot distinguish the safe borrowers from risky. In this theory, the bank which is the lender in this case has inadequate information about the loan customers. Riskier loan clients ought to be charged a higher rate of interest so as to act as a compensation for an increased default risk than the safer loan clients whose changes of defaulting are very low. Accordingly, safer loan clients ought to be charged a little bit less provided they can be identified accurately from the rest of loan clients or borrowers. Since banks as the lender does not have complete borrowers risk profile information, as such, high average interest rates are normally passed on to all loan clients without considering differences in their risk profile (Armendariz & Morduch, 2010). To mitigate adverse selection problems, credit providers take their loan applicants through an elaborate screening procedure before granting a loan however, this has been able to reduce loan default in commercial banks.

Empirical Review

Bizuayehu (2016) assessed effect of the management of credit risk on profitability of Ethiopian banks. This study established that, credit risk which is measured by NPL ratio, which indicated a significant inverse impact on financial performance of Ethiopians commercial banks. Sufi and Qaisar (2015) carried out a study on importance of management practices of credit risk on the performance of loan when the credit terms are taken and policy, appraisal of clients and control of credit risk in Pakistan. The study established that credit terms and appraisal of clients has a positive and a significant impact on performance of loan, whereas credit policy and control of credit risk has insignificant but positive effect on loan performance.

Mutua (2015) examined impact of credit risk mitigation to commercial bank's performance and established a significant relation between the banks performance and the management 6 of credit risk in terms of risk identification, monitoring and credit sanctions and conclude that better management of credit risk results in a more better commercial bank performance.

Aduda and Gitonga (2011) explored a relation between the management of credit risk and the banks' lending profitability and concluded that management of credit risk has a great impact on commercial banks profitability. The effects of management of credit risk practices on profitability of SACCOs that are allowed to take deposits were investigated by (Makori, 2015).

Bhattarai (2016) examined effect of credit risk on Naples commercial banks' performance. A causal-comparative and descriptive research designs was used. The data was obtained from 14 banks for period between the years 2010 - 2015. The study established that NPL loan ratio had adverse effect on performance of banks while the cost of a loan asset had a positive effect on the overall performance of the banks. It was found that indicators of credit risk, size of the bank had a positive impact on the banks' performance. The study established that the ratio of capital adequacy and cash reserve had no influence on bank performance hence a conclusion of a significant relation between performance of the bank and credit risk indicators. However, this study focused on effect of the credit risk on banks performance and not management of credit risk practices and the financial performance.

Alshatti (2015) assessed effect of credit risk management on Jordan commercial banks performance in financial perspective. The study sampled thirteen banks for the years 2005 – 2013 and established that management of credit risk impacts the banks' financial performance. From this study, it was resolved that management of credit risk indicators has a significant effect on banks' financial performance. The study recommended that banks should develop or adopt a credit risk management system to help them to improve or enhance their profits. The study focused on credit risk indicators including nonperforming loans, leverage and loss provision on facilities and not on the risk management practices like credit risk identification, appraisal, control and monitoring.

Kalui and Kiawa (2015) studied credit risk management procedures and processes adopted on performance of Kenyan microfinance organizations. A descriptive design was employed in the study. Population of the survey comprised of credit managers and officers of the 54 Microfinance Institutions in Nairobi County. It was found that the sampled organizations considered risk identification, risks monitoring, risk assessment, risk analysis as a process in credit risk management. The study also established that these procedures were important as they ensured that the function of risk management was established in all institution. However, the study solely focused on microfinance institutions in Kenya and not commercial banks.

Kibor, Ngahu and Kwasira (2015) assessed effect of the management of credit risk practices on loan performance of all Nakuru Town banks using a descriptive and correlation research design. The study carried out a census of the commercial banks' branches in Nakuru town and collected data using a questionnaire. The study established an existence of a moderate positive and useful relation between the loan performance and lending policies. The correlation between loan performance and credit standards was established to be positive and statistically significant but the study focused on credit risk management practices on loan performance and not financial performance.

Tanui, Wanyoike and Ngahu (2015) examined the effect of credit scoring and credit administration on performance in financial perspective of SACCOs in Nakuru County. This study used a descriptive survey design and targeted credit officers and credit managers in those selected SACCOs. Questionnaires were used in data collection from the sample of 90 respondents. The study findings revealed a strong association between the credit scoring and the performance in financial perspective of the SACCOs and found that credit administration in deposit-taking SACCOs had a strong

relationship with performance in financial perspective. The study recommended that SACCO's should improve on their 18 credit scoring and credit administration as credit management practices to improve on their financial performance but the study focused on SACCOs and not commercial banks in Kenya.

Li and Zou (2014) examined the relation between management of credit risk and European banks' profitability. The data of 47 European banks for a 5 years period from 2007 -2012 was used and established that management of credit risk had a positive effect on profitability of European banks. It was found that management of credit risk, measured using NPLR had a significant impact on both ROA and ROE whereas CAR had insignificant impact on ROE and ROA. The study further found that from the year 2007 to the year 2012, the relation between all the proxies were fluctuating but the study focus was on credit risk indicators evaluate using NPLR and not credit risk management indicators like risk identification, appraisal, control and monitoring.

Idowu and Awoyemi (2014) investigated effect of management of credit risk on performance of Nigerian banks. The study obtained financial reports data of the seven banking firms form the year 2005 to 2011. The study applied the panel regression model to analyze collected data. The ROE and ROA were examined in measuring performance in financial perspective whereas the NPLs and ratio of capital adequacy were used as indicators of the management of credit risk. The findings of the study established that the management of credit risk had a significant impact on banks profitability but the study did not examine the relation between the credit risk management indicators like risk identification, appraisal, and control and monitoring.

Kimari (2013) examined impact of management of credit risk on performance in financial perspective of Kenyan Savings and Credit Co-operative Societies that take deposits. The study population comprised of the heads of credit risk management function of the 215 total numbers of all deposit-taking SACCOs that are under supervision by SASRA. Using Pearson correlation analysis and a multiple regression model, the study concluded that management of credit risk affects the SACCOs financial performance. Management should carefully consider the Capital Adequacy, Earnings, Liquidity and so on as they all positively correlate with the Return on Equity of the SACCOs. However, the context of the study was SACCOs and not commercial banks whose operations and scope are different.

Poudel (2012) explored parameters that are related to the management of credit risk as it affects the banks performance in financial perspective. The parameters included cost per loan assets, default rate and the ratio of capital adequacy. The study used secondary data from 31 for eleven years (2001-2011). The study revealed that cost per loan assets, rate of default and ratio of capital adequacy had inverse relationship on the banks' performance in financial perspective; however, the rate of default is the main bank' performance in financial perspective predictor. It was recommended that banks to formulate or design strategies that will enhance the bank's profitability as well as minimizing the credit risk exposure. However, credit risk management indicators were not among the parameters that were assessed. Credit risk management indicators like risk identification, appraisal and control and monitoring are vital to commercial banks.

Addae-Korankye (2014) on the causes and control of loan default/delinquency in microfinance institutions in Ghana, the study found that the causes of loan default included high interest rate, inadequate loan sizes, poor appraisal, and lack of monitoring and improper client selection. Measures to control default were found to include training before and after disbursement, reasonable interest rate, monitoring of clients, and proper loan appraisal. It was recommended among others that MFIs should have clear and effective credit policies and procedures and must be regularly reviewed. It was concluded that the government and hence Bank of Ghana should regularly monitor and supervise the MFIs so as to ensure safety of

Mwithi (2012) conducted a study to determine the relationship between credit risk management practices and the level of non-performing loans of microfinance institutions in Nyeri County, Kenya. The study found out that the level of credit risk assessment and management was high in the MFIs. It was also found out that effective management of their institutions was affected by liquidity and profitability, and that asymmetric information in loan market affects the effective management of NPLs in MFIs in Nyeri County. The study found that inability to enforce covenants leads to NPLs among MFIs in Nyeri County to a very large extent. The study concluded that the relationship between credit risk management approaches employed by Micro Finance Institutions in Nyeri County

and the level of Non-Performing Loans was a negative correlation i.e. the higher the level of credit risk management, the lower the level of NPLs.

Nyong'o (2014) examined the relationship between credit risk management and non-performing loans in commercial banks in Kenya. It was found that credit risk management practices adopted by the banks influences the level of non-performing loans to a great extent and that risk identification, risk monitoring and risk analysis and appraisal would lead to decrease in non-performing loans while bank size and interest rates would lead to increase in non-performing loans. The study further recommended that the boards of commercial banks should outline risk management strategy and formulate well-defined policies and procedures. That Risk management department should be made on portfolio or business line basis, to adopt a holistic approach judging the overall risk exposure in assessing and managing risk profile of the bank. Credit Appraisal process

Arko (2012) on the causes and effects of NPLs on MFIs' operations in Ghana, it was asserted that the lender should ensure that good decisions are made relative to granting of loans with the object of minimizing credit risk. In other words, the lender ought to always aim to assess the extent of the risk associated with the lending and try to minimize factors that could otherwise compromise repayment. The scholar further asserts that, needless to say, the lender should gather information regarding the prospective borrower that will assist in reaching a sound credit decision. It was noted that in order to mitigate NPLs which are occasioned by non-repayment of loans, MFIs in Ghana have adopted a standard loan request procedure and requirements that are usually contained in credit policy manual with the object of guiding loan officers and customers.

Orua (2009) conducted a study on the relationship between loan applicant appraisal and loan performance of microfinance institutions in Kenya. The study revealed that short-term debt significantly impacted MFI outreach positively. Long term debt however showed positive relationship with outreach but was not significant with regard to default rates.

Kisaka and Simiyu (2014) on credit risk management techniques used by microfinance institutions in Kenya established that most microfinance institutions use 6C techniques of credit risk management. The study results also revealed that understanding the organizations exposure to credit is treated as critical by the microfinance institutions. To avoid loan losses, the microfinance institutions used follow ups. The results also show that MFIs take loan review analysis as crucial aspects of risk management by doing proper documentation and analysis. The results also show that the microfinance institutions are faced with the challenge of strict operational regulations from the Central Bank of Kenya. Loan recovery is a major challenge to the majority of the institutions.

Mutua (2014) evaluated the effect of credit risk management on the financial performance of commercial banks in Kenya. The study targeted auditors of all commercial banks in Kenya; the population of the study were the credit controllers of all the 43 commercial banks in Kenya. Primary data was collected using questionnaires which were administered using drop and pick method by the researcher. The data was then analyzed using quantitative techniques. The study concluded that bank considers risk identification as a process in credit risk management, that the bank focuses in interest rate risks in the risk identification map and that the bank focuses in foreign exchange risks. The study also concluded that in view of risk analysis as a credit risk management practice in the bank the application of modern approaches to risk measurement, particularly for credit and overall risks is important for commercial banks and that risk analysis helps the bank management to discover mistake at early stages and that risk monitoring can be used to make sure that risk management practices are in line with proper risk monitoring.

Mutua (2016) did a study on the impact of credit risk management on financial performance of savings and credit co-operative societies in Kitui County. The research design used in this study was a descriptive research design. The data collection instruments in this case included self-administered questionnaires which were used to extract valuable primary data from the SACCOs' management. The study used quantitative method to analyze the data and examine the simultaneous impact of the independent variables on the dependent variable. The findings indicated that there was a very strong positive relationship between credit monitoring and financial performance of SACCOs, a very strong positive relationship between loan policy in mitigation of risk and financial performance of SACCOs and that there was a very strong positive relationship between loan defaulters and financial performance of SACCOs.

Muasya (2013) investigated the relationship between credit risk management practices and loans losses - a study on commercial banks in Kenya. Descriptive research design was utilized in this study as it aimed to see if there is a relationship between credit risk management practices and loan portfolio losses in commercial banks in Kenya. Research findings indicated that a significant number of commercial banks in Kenya had not put in place credit risk management information systems to effectively measure, monitor and control and identify risk, and that majority of management of commercial banks in Kenya recognized the need for information sharing among players within the industry in order to mitigate the risk. It was concluded that credit risk management practices are common among most of the commercial banks in Kenya and that management of these commercial banks appreciated government legislation relating to credit risk management through the introduction of the credit sharing information Act, and that there is a significant negative relationship between credit risk management practices and loan losses in commercial banks in Kenya.

Negera (2012) assessed the determinants of non-performing loans. The mixed research approach was adopted for the study. Survey was conducted with professionals engaged in both private and state owned Banks in Ethiopia holding different positions using a self- administered questionnaire. In addition, the study used structured review of documents and records of banks and in-depth interview of senior bank officials in the Ethiopian banking industry. The findings of the study shows that poor credit assessment, failed loan monitoring, underdeveloped credit culture, lenient credit terms and conditions, aggressive lending, compromised integrity, weak institutional capacity, unfair competition among banks, willful default by borrowers and their knowledge limitation, fund diversion for unintended purpose, over/under financing by banks ascribe to the causes of loan default.

Ahmed and Malik (2015) on credit risk management and loan performance. They examined credit risk management and loan performance with credit terms, client appraisal, collection policy, credit risk control as independent variables and loan performance as dependent variable. The results of the analysis showed that the credit terms and client appraisal have positive and significant impact on the loan performance, while the collection policy and credit risk control have positive but insignificant impact on loan performance.

Gladys (2012) did a study to establish the effect of credit risk management techniques used to evaluate SMEs on the level of Nonperforming loans by Commercial banks in Kenya. A descriptive study of credit risk management techniques was used by commercial banks in Kenya was carried out on all the banks. A regression analysis was developed in order to examine the relationship credit risk management and SME Nonperforming loans in Banks in Kenya. The study established that there is a negative relationship between Credit Risk Management and nonperforming loans.

METHODOLOGY

The study adopted quasi experimental research design to study the effect risk management on the return on equity of the selected microcredit institutions. The target population of this study includes all 940 microfinance banks in Nigeria. However, the sample size was limited to the 14 quoted microcredit institutions that are reporting to the Nigerian stock exchange.

Data Analysis Method

The method of data analysis to be used in this study was the panel data multiple linear regressions using Ordinary Least Square (OLS) method. This approach, which is a quantitative technique, includes tables and the test of the hypotheses formulated by using ordinary least square regression analysis at 5% level of significance. To arrive at a result that will not lead to spurious regressions, the study will test for stationarity at different levels in the variables making up the model. Other tests that will be carried out on the model include test of Normality, Durbin Watson Test of serial correlation, test of heteroskedasticity and test of model specification so as to achieve the objectives of our study as well as answer the research question and hypotheses. Moreover, in order to undertake a statistical evaluation of our analytical model, so as to determine the reliability of the results obtained and the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the student T-test and F-test will be employed.

Model Specification

The study adopts the panel data method of data analyses which involve the fixed effect, the random effect and the Hausman Test.

Pooled Effect Model

$$ROE_{it} = \beta_0 + \beta_2 CDL + \beta_3 CDD + \beta_4 CDE + \beta_5 LLP + \varepsilon_{it}$$

(1)

Fixed Effects

The fixed effects focus on whether there are differences by using a fixed intercept for each of the different cross-sectional structures. If we assume that the dummy variable for a conglomerate company is 1 or 0, then D_i, which is the dummy variable for firm i, can be expressed as:

$$D_i = \begin{cases} l, & i-1 \\ 0, & otherwise \end{cases} \quad D_2 = \begin{cases} l, & i-2 \\ 0, & otherwise \end{cases} \quad \dots \quad D_N = \begin{cases} l, & i-1 \\ 0, & otherwise \end{cases}$$

(2)

The regression of total samples can be expressed as:[1]

$$Y_{it} = \sum_{i=1}^{N} \beta_{oi} D_i + \beta_i D_s + \beta_2 D_{ma} + \beta_3 s_1 + \beta_{oi} D_4 s_2 + \varepsilon_{it}$$

(3)

The dummy variables are expressed as follows: if $j = i$, then $Di = 1$; otherwise $Di = 0$.[2]

To further investigate the fraud effect, Adebayo (2012) analyzed whether the independent variables affect the dependent variable, this regress the effect of the independent variables on the dependent variables.

$$ROE_{it} = \beta_0 + \beta_2 CDL + \beta_3 CDD + \beta_4 CDE + \beta_5 LLP + . \quad \varepsilon_{it}$$

(4)

Because the fixed effects account for both cross-sectional and time-series data, the increased covariance caused by individual-firms differences is eliminated, thereby increasing estimation-result efficiency.

Random Effects

Random effects focus on the relationship with the study sample as a whole; thus, the samples are randomly selected, as opposed to using the entire population. The total sample regression (a function of the random effect) can be expressed as:

$$ROE_{it} = \sum_{j=1}^{N} \beta_0 + \beta_2 CDL + \beta_3 CDD + \beta_4 CDE + \beta_5 LLP + \mu$$

(5)

If this is represented with random variables, then $\beta_{oj} = \overline{\beta}_0 + \mu_j$, which indicates that the difference occurs randomly, and the expectation value of β_{oi} is $\overline{\beta}_0$.[5]

(6)

ROE　　　　　=　　　　Return on Equity

CDL　　=　Credit limit measured by percentage of increase/ decrease in loan loss provisions
CDD　　=　　　　credit diversification measured by percentage of credit to various sectors of the economy
CDE　　　　=　　　　Credit valuation measured by percentage of nonperforming loans
LLP　　　　=　　　　Loan loss provision measured by percentage of loan loss provisions to total loans and advances
Ut　　　　=　　　　Error term

Hausman Test

The Hausman test YairMundlak,(1978) is the most commonly used method for evaluating fixed and random effects. If variables are statistically correlated, then the fixed-effects estimation is consistent and efficient, whereas the random- effects estimation is inconsistent, and the fixed-effects model should be adopted. Conversely, if the variables are statistically uncorrelated, then the random-effects estimation is consistent and efficient, whereas the fixed-effects estimation is consistent but inefficient, and the random-effects model should be adopted.-

A-prior Expectation of the Result
The explanatory variables are expected to have positive and direct effects on the dependent variables. That is a unit increase in any of the variables is expected to increase ROE. This can be express mathematically as a_1, a_2, a_3, $a_4 < 0$

ANALYSIS AND DISCUSSION OF FINDINGS
Table 1: Analysis of Panel Unit Root Test

Method: Series: ROE	Statistic	Prob.**	Cross-sections	Obs
Panel Unit Root at Level				
Levin, Lin & Chu t*	-5.30927	0.0000	14	112
Im, Pesaran and Shin W-stat	-2.25411	0.0121	14	112
ADF - Fisher Chi-square	50.8799	0.0052	14	112
PP - Fisher Chi-square	123.389	0.0000	14	126
Series: LLP				
Levin, Lin & Chu t*	-1.91190	0.0279	14	112
Im, Pesaran and Shin W-stat	-1.20302	0.1145	14	112
ADF - Fisher Chi-square	36.4107	0.1324	14	112
PP - Fisher Chi-square	108.405	0.0000	14	126
Series: CDD				
Levin, Lin & Chu t*	-1.82135	0.0343	14	112
Im, Pesaran and Shin W-stat	-1.37636	0.0844	14	112
ADF - Fisher Chi-square	38.6574	0.0866	14	112
PP - Fisher Chi-square	103.571	0.0000	14	126
Series: CDE				
Levin, Lin & Chu t*	-2.22161	0.0132	14	112
Im, Pesaran and Shin W-stat	-2.05178	0.0201	14	112
ADF - Fisher Chi-square	47.0790	0.0134	14	112
PP - Fisher Chi-square	140.192	0.0000	14	126
Series: CDD				
Levin, Lin & Chu t*	-3.74312	0.0001	14	112
Im, Pesaran and Shin W-stat	-1.91603	0.0277	14	112
ADF - Fisher Chi-square	46.1724	0.0167	14	112
PP - Fisher Chi-square	96.1202	0.0000	14	126
Panel Unit Root at Difference				
Series: D(ROE,2)				
Levin, Lin & Chu t*	-19.3785	0.0000	14	84
Im, Pesaran and Shin W-stat	-7.75445	0.0000	14	84
ADF - Fisher Chi-square	110.221	0.0000	14	84
PP - Fisher Chi-square	252.339	0.0000	14	98
Series: D(LLP,2)				
Levin, Lin & Chu t*	-40.5445	0.0000	14	84
Im, Pesaran and Shin W-stat	-11.3739	0.0000	14	84
ADF - Fisher Chi-square	105.620	0.0000	14	84
PP - Fisher Chi-square	224.875	0.0000	14	98
Series: D(CDL,2)				
Levin, Lin & Chu t*	-20.7693	0.0000	14	84
Im, Pesaran and Shin W-stat	-7.60255	0.0000	14	84
ADF - Fisher Chi-square	106.025	0.0000	14	84
PP - Fisher Chi-square	223.806	0.0000	14	98
Series: D(CDE,2)				
Levin, Lin & Chu t*	-32.4560	0.0000	14	84
Im, Pesaran and Shin W-stat	-9.64651	0.0000	14	84
ADF - Fisher Chi-square	112.199	0.0000	14	84
PP - Fisher Chi-square	225.963	0.0000	14	98
Series: D(CDD,2)				
Levin, Lin & Chu t*	-28.2248	0.0000	14	84
Im, Pesaran and Shin W-stat	-11.2952	0.0000	14	84
ADF - Fisher Chi-square	129.371	0.0000	14	84
PP - Fisher Chi-square	221.180	0.0000	14	98

Table 2: Pedroni Residual Cointegration Test

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-2.914083	0.9982	-3.495294	0.9998
Panel rho-Statistic	3.609419	0.9998	3.431100	0.9997
Panel PP-Statistic	-2.494102	0.0063	-1.231441	0.1091
Panel ADF-Statistic	-3.214669	0.0007	0.459296	0.6770

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	5.230909	1.0000
Group PP-Statistic	-6.317004	0.0000
Group ADF-Statistic	0.578571	0.7186

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
Fortis microfinance	0.285	0.501326	0.458419	2.00	9
NPL Microfinance	-0.373	2.112986	0.534625	8.00	9
Credit link microfinance	0.433	3.465873	3.843265	1.00	9
Lapo microfinance	-0.335	7.779340	1.308286	8.00	9
AB Microfinance bank	0.448	9.624584	7.666196	1.00	9
FINCA Microfinance	-0.439	8.651791	2.275865	8.00	9
Mutual microfinance	0.351	3.651015	3.651015	0.00	9
Regent microfinance	-0.729	3.060614	2.458382	1.00	9
Fims microfinance	0.158	35.92357	12.47458	8.00	9
Accion microfinance	0.285	0.501326	0.458419	2.00	9
BFL Microfinance	-0.373	2.112986	0.534625	8.00	9
CIT Microfinance	0.433	3.465873	3.843265	1.00	9
Capstone microfinance	-0.335	7.779340	1.308286	8.00	9
Barclays microfinance	0.448	9.624584	7.666196	1.00	9

Table 3: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LLP does not Granger Cause ROE	112	0.00193	0.9981
ROE does not Granger Cause LLP		0.65287	0.5226
CDL does not Granger Cause ROE	112	0.94445	0.3921
ROE does not Granger Cause CDL		1.07257	0.3458
CDE does not Granger Cause ROE	112	0.00313	0.9969
ROE does not Granger Cause CDE		1.05257	0.3526
CDD does not Granger Cause ROE	112	0.40420	0.6685
ROE does not Granger Cause CDD		1.96690	0.1449

Table 4: Regression Results

Variable	Coefficient		Std. Error	t-Statistic	Prob.
Pooled Effect Regression Results					
LLP	-0.153872		0.196025	-0.784962	0.4339
CDL	0.303090		0.226966	1.335401	0.1840
CDE	0.460992		0.269123	1.712942	0.0890
CDD	-0.196199		0.315479	-0.621908	0.5351
C	25.48664		3.359164	7.587198	0.0000
R-squared	0.248981	Mean dependent var			42.83014
Adjusted R-squared	0.226729	S.D. dependent var			6.475358
S.E. of regression	5.694161	Akaike info criterion			6.351821
Sum squared resid	4377.169	Schwarz criterion			6.456879
Log likelihood	-439.6274	Hannan-Quinn criter.			6.394513
F-statistic	11.18894	Durbin-Watson stat			2.068081
Prob(F-statistic)	0.000000				
Fixed Effect Regression Results					
LLP	-0.197330		0.199872	-0.987279	0.3255
CDL	0.220416		0.239039	2.922093	0.0023
CDE	0.600340		0.272859	2.200186	0.0297
CDD	-0.170243		0.325121	-2.523629	0.0015

C	23.74447		3.557708	6.674091	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.734013	Mean dependent var	42.83014
Adjusted R-squared	0.641212	S.D. dependent var	6.475358
S.E. of regression	5.640584	Akaike info criterion	6.417374
Sum squared resid	3881.574	Schwarz criterion	6.795585
Log likelihood	-431.2162	Hannan-Quinn criter.	6.571067
F-statistic	3.599227	Durbin-Watson stat	2.296929
Prob(F-statistic)	0.000017		

Random Effect Regression Results

LLP	-0.153872	0.194180	-0.792418	0.4295
CDL	0.303090	0.224830	1.348085	0.1799
CDE	0.460992	0.266591	1.729212	0.0861
CDD	-0.196199	0.312510	-0.627815	0.5312
C	25.48664	3.327557	7.659266	0.0000

Effects Specification

		S.D.	Rho
Cross-section random		0.000000	0.0000
Idiosyncratic random		5.640584	1.0000

Weighted Statistics

R-squared	0.248981	Mean dependent var	42.83014
Adjusted R-squared	0.226729	S.D. dependent var	6.475358
S.E. of regression	5.694161	Sum squared resid	4377.169
F-statistic	11.18894	Durbin-Watson stat	2.068081
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.248981	Mean dependent var	42.83014
Sum squared resid	4377.169	Durbin-Watson stat	2.068081

Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.082909	4	0.0316

Source: Extract form E-view

ANALYSIS AND DISCUSSION OF FINDINGS

* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality, Im, Pesaran and Shin; ADF - Fisher and PP - Fisher - Null Hypothesis: Unit Root (Individual Unit Root process). Levin, Lin & Chu Test.
 - Null Hypothesis: Unit Root (common Unit Root process), Automatic lag length selection based on Modified Schwarz Criteria and Bartlett kernel.

It can be seen from the Table 1 that the data are stationary at first difference for 1%, 5% and 10% levels of significance. It is therefore deduced that the series are characterized as I (1) process; consequently, suitable for a use in a test for panel cointegration between risk management and return on equity of the microcredit institutions.

From table 2, the cointegration test is consistent with Pedroni (2004), which is an Engle-Granger based test. The test allows for heterogeneous intercepts and trend coefficients across cross-sections, with different methods of constructing statistics for testing the null hypothesis of no cointegration. It is clear that most of the p-values are all less than 0.05. We can therefore safely conclude that the panel cointegration results provide us with evidence of cointegration since most of Pedroni test statistics reject the null hypothesis of no cointegration for the estimated models.

The results of the power for the entire test procedure based on the underlying time series model is stationary as all the procedures produced a reasonably high power over all the sample sizes and order considered except at order 2 where ADF (Augmented Dickey Fuller) produced extremely low power. The power of the tests is extremely high over all the sample sizes and orders considered. From the coefficient of the sample size, most of the firms have linear relationship and also integrated in the order of 1(1). Results in table 3 show that there is neither a bi-directional nor uni-directional causal relationship between any pair of the variables in the model given that all p-values are higher than 0.05.

The table presented in 4 has details on the credit management on the microcredit institutions in Nigeria, a cross examination of the validity of the models found that the fixed effect model is statistically significant and accepted for analysis in this study. From the fixed effect model, the independent variables can explain 64.1percent variation on the return on the investment of the quoted microcredit institutions under study. The f-statistics and f-probability justifies that the fixed effect model is statistically significant. However, the beta coefficient of the variables proved that loans loss provision and credit diversification have negative relationship with return on equity of the microcredit institutions while credit limit and credit evaluation have positive relationship with return on equity of the microcredit institutions. The estimated regression result above showed that with a positive value of 23.74447 as intercept return on equity of the microcredit institutions will increase with a unit increase in the value of credit management and unpaid interest will impact negatively to the return on equity. The positive value of -0.197330 as parameter for loan loss provision indicates that a unit increase in the value will reduce return on equity by 0.19 percent, the negative impacts contrary to the prior expectation of the study, the finding is contrary to the findings of Felix and Claudine (2008) on the relationship between non-performing loans and banks profitability performance.

The negative relationship might be the reason for banks loans administration policies and monetary policy objectives and bank credit regulations. It might also be as a result of the compliance to Prudential Guideline on disclosure which the bank might have written off from the balance sheet significant proportion of nonperforming loans and make provisions to be written off from earning of the banks based on the classification by Prudential Guideline for Licensed Banks introduced in 1991. This findings contrary to the findings of Kithinji (2011) that the bulk of the profits of commercial banks is not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact on profits and that there is no relationship between profits, amount of credit and the level of nonperforming loans and the findings Macharia (2012) that non-performing loan in deposit taking microfinance institutions account for the greatest percentage of the variance in the profitability of the institutions.

The negative value -0.170243 as parameter for borrower's credit diversification revealed that a unit increase will reduce bank profit by 0.17 percent, this finding contrary to the prior expectation; the negative effect of the variables implies that credit management in the deposit money banks has challenges. This confirms the increase on the value of nonperforming loans in Nigeria banking sector. While paid interest ads to the profitability performance of the bank, unpaid interest reduces the profitability of the bank. It is considered as a lost to the bank and written off from the balance sheet of the banks.

The positive coefficient of 0.220416 as parameter for credit limit and the positive value 0.600340 as parameter for credit evaluation implies that a unit increases will increase return on equity by 0.22 and 0.6 percent. The significant and large impact of the variables on microcredit institutions return on equity might be as a result of favorable bank lending environment such as macro-economic factors, political factors and the regulatory environment such as expansionary monetary policy. The findings confirm the prior expectation of the study. This finding confirm the findings of Saba, Kauser and Azeem (2012) that real total loans have positive significant effect whereas interest rate and GDP per capital has negative significant association with NPLs, the findings of Mileris (2012) that NPLs are highly dependent of macroeconomic factors and the findings of Kolapo, et al. (2012) that non-performing loans and loan losses provisions are adversely affecting the performance while total loans to advance plus deposit ratio has positive significant effect on the performance.

CONCLUSION

The objective of the study was to establish the effect of credit risk management on return on equity of microcredit institutions in Nigeria. The concepts in the study are credit management risk and profitability in context of commercial banks in Nigeria. Return on equity is the dependent variable while credit management was measured by loan loss provision, credit limit, credit diversification and credit evaluation. The panel data in this analysis covered a period of 10 years from 2011-2020 with the Multi linear regression model used to analyze the data. The findings established that credit management and accounts positively affect return on equity of microcredit institutions. It also indicate that credit management are good measure of credit management as the findings indicate that it is appropriate and statistically significant in explaining variance with return on equity. In particular

credit management and return on equity ratio analysis can inform better on the effects of credit management on return on equity of microcredit institutions than mere comparison of quantum figures. This study examined the effect of credit management on return on equity of microcredit institutions in Nigeria. The regression results indicate that credit management affect return on equity of microcredit institutions in Nigeria. The study found that credit limit measured by percentage of increase/ decrease in loan loss provisions have negative and significant effect on return on investment of microcredit institutions in Nigeria. This implies that the null hypothesis is accepted. This means that increase or decrease on the variables will have meaningful effect on return on equity of the microcredit institutions. It was observed that credit diversification measured by percentage of increase/ decrease in microcredit institutions credit has negative and significant effect on return on return on equity of microcredit institutions in Nigeria. This implies that the null hypothesis is not accepted. This means that increase or decrease on the variables will have meaningful effect on return on equity of the microcredit institutions. Credit evaluation measured credit limit by value of securities has positive and significant effect on return on equity of microcredit institutions in Nigeria. This implies that the null hypothesis is accepted. This means that increase or decrease on the variables will not have any meaningful effect on return on equity of the microcredit institutions. Loan loss provision has positive and significant effect on return on equity of microcredit institutions in Nigeria. This implies that the null hypothesis is accepted. This means that increase or decrease on the variables will not have any meaningful effect on return on equity of the microcredit institutions.

RECOMMENDATIONS

  i. Based on the findings of this study work, the researcher recommends the need to strengthen supervision of banks by the Central Bank of Nigeria (CBN) and the Nigeria Deposit Insurance Corporation (NDIC) to prevent a sharp buildup of NPLs in the future; Banks should maintain high credit standards while the Apex Bank and other regulatory agencies should maintain high surveillance on banks' credit operations; Banks should collect and perfect all collaterals which are used for obtaining loans. The collateral should be more than the value of loan approved, in case of default.

 ii. Microcredit institutions management should consider monitoring of loans as priority in credit management functions. Insider dealing should be outlawed in banks in Nigeria. This was a major source of huge nonperforming loans portfolio in 1990s. Over extension of loans to promoters, directors and other large shareholders is often done at the detriment of depositors because such funds often become irrecoverable.

iii. Credit evaluations of borrowers should be considered in the process of credit management and banks must endeavor to comply with both internal and external lending procedures as this will reduce the incidence of nonperforming loans. Most failed banks were victims of compromising of lending principles because loans that were granted with full knowledge of the violation of sound banking and credit risk principles are hardly repaid.

iv. Loans ought to be made on the basis of sound collateral. Even though not a credit evaluation for sound lending, it could serve as a soft cushion for the recovery of nonperforming loans and regular regulatory supervision is imperative for sound banking. This will expose lapses of technical incompetence on the part of management and enforce disclosure of vital information needed for the evaluation of the state of the bank.

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