The relationship between the risk management practices and financial performance of the Nigerian listed banks

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Abstract: We examine the relationship between the risk management practices and financial performance of the listed companies in Nigeria for the period of ten year from 2005 to 2014, with a particular attention on the 21 deposit money banks. Specifically, the study investigates how risk limit setting, risk adherence monitoring, risk policy review, credit risk management, operational risk management and market risk management has impacted the financial performance of listed banks in Nigeria. We employ both the primary (survey questionnaire) and secondary (audited financial statement) as sources of data. The overall results reveals that risk management practices have a statistically significant impact on financial performance. The results also reveals the trend in risk management practices in other developing economy such as Ghana, Pakistan, Kenya, Thailand, Tehran and the current global practices in Serbian and United state as presented in the literature review. This result leads to a recommendation that adequate risk management system should be put in place by the board of directors which should include the establishment of company's annual risk limit, risk appetite and risk strategy to curtail the excessive risk taking of the management. This system should be reviewed regularly to determine its adequacy, effectiveness and compliance level of the management with this risk management system..

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Keywords: Risk Management Practices, Market Risk Management, Operational Risk Management, Credit Risk Management, Return on Capital Employed, Earnings per Share.

JEL codes: M41

1. Introduction

The main objective of this study is to examine the relationship between the risk management practices and financial performance. The study focused on the deposit money banks listed on the Nigeria stock exchange for a ten year period from 2005 to 2014. Three aspect of risk management practices which include risk limit setting, monitoring of adherence to risk limit and risk policy review were evaluated in addition to three inherent risks faced by the listed banks which includes the credit risk, operational risk and market risk. To evaluate financial performance, two measures of financial performance were considered, that is, return on capital employed and earnings per share.

Risk management according to Stanton (2012) refers to the process by which an organization identifies and analyses threats, examines alternatives, and accepts or mitigates those threats even before they begins to impede the activities of the organization. Similarly, Culp (2008) opined that risk management is viewed today as one of the key characteristics of successful companies which enable firms to view all risks facing them through some form of pre-planned activities. Also, risk management can be perceived as a management process that requires a firm's management to identify and assess the collective risks that affect firm value and apply an organizational wide strategy to manage those risks in order to attain higher level of efficiency (Meulbroek, 2002).

The primary goal of risk management is to maximize shareholder value (Beasley *et al.,* 2008; Hoyt & Liebenberg, 2011; Pagach & Warr, 2011). Banner *et al.* (2004) asserted that risk management is a value adding technique that is aimed at generating additional profit for a company by giving an overview of all risky activities, constructing recovery plans and constant monitoring of day-to-day operations. Thus, Hoyt and Liebenberg (2011) suggested that profit maximizing firms should consider implementing only an aspect of risk management that increases expected shareholder wealth. According to Vieira (2010), increase in risk complemented by risk concentration may confer vulnerability to corporate segment. Therefore, risk management strategies contribute in an essential manner to value creation of a business organization.

Furthermore, the global trend in company failures, corporate scandals, fraud and malpractices are among the reasons for companies to effectively implement risk

management programs. These companies' failures have been linked to poor risk management and weak corporate governance (Manab *et al.*, 2010). Rosen and Zenios (2001) emphasize that corporate governance is vital for effective risk management and that none of the risk management activities can be achieved without corporate governance compliance. Thus, corporate governance and risk management are therefore interrelated and interdependent implying that stability and improvement of the company's performance are highly dependent on the effective role of both components (Sobel & Reding, 2004; Manab *et al.*, 2010).

On the relationship between the risk management system and banks' performance, listed banks serves as financial intermediaries, thus, risk management is of much concern to them, as it is to the other listed companies. In fact, listed banks face a greater number of risks than other sectors of the economy (Nocera, 2009). These additional risk exposure stems from the huge capital being kept in the custody of the bank officials (Khan & Ahmed, 2011). Therefore, in order to mitigate these greater risks, listed banks have been encouraged to allocate more resources to risk management (Ongore, 2011). Although, efficient risk management may draw resources and adversely affect profitability, it is crucial for their long term sustainability (Stanton, 2012).

Al-Tamimi and Al-Mazrooei, (2007) also noted that effective risk management is not only necessary for giving reasonably high returns to the shareholders but prudent risk management is also the signal to avoiding financial distress that could lead the organization to bankruptcy. Therefore, risk management in the banking industry is of necessity to the industry players, as well as for policy makers. In spite of the afore-mentioned role of risk management to the performance of banking institution, literatures on the relationship between the risk management practices and the financial performance of listed banks are very scarce. This gap necessitated the current study. The rest of the paper is as follow: Section 2 was dedicated to the review of relevant literatures. The research methodology was presented in section three. Presentation and analysis was done in section four while section five was committed to the conclusion and recommendations.

2. Risk management system and financial performance: an empirical review

In the aftermath of the financial crisis, there have been series of proposals from policy makers and international organizations regarding corporate governance reforms that need to manage the risks that financial institutions pose for the economy (Alexander, 2012). These proposals have been addressing either better risk management, by creating a risk management committee at the level of the

board of directors, or by narrowing the incentives for compensation, or by altering the rules of limited liability (Mulbert & Citlau, 2011). The ideas that have been promoted regarded the expertise in risk management of the board members, the presence in the board meetings of the chief risk officer, or the creation of risk management committees at the level of the board. All the proposals targeted the creation of risk management procedures.

At the international level, the advanced ideas suggested that corporate governance procedures have to be used in improving the risk management and support the financial stability (Walker, 2009). The significance of risk management has been stressed by the Basel Committee on Banking Supervision in 2010 report, 'an effective internal controls system and a risk management function (including a chief risk officer or equivalent) with sufficient authority, stature, independence, resources and access to the board' (Basel Committee on Banking Supervision, Principles of Enhancing Corporate Governance, 2010). Similar position had OECD, which emphasized on the risk management at the firm level and on the presence of chief risk officer (OECD Steering Committee on corporate Governance, Corporate Governance and the Financial Crisis, 2010).

The question that is raised when it comes to risk management is how much risk is acceptable? International guidelines provide no practical procedures on the measurement of risk, besides the conceptual long-term value-based approach, which implies a continuous assessment of risky decisions (Dermine, 2011). The 2007-8 financial crises have raised awareness on the need for proper risk management mechanisms as part of the corporate governance. Initially, the literature on risk management was focused on isolated treatment of uncertainties (Miller, 1992) while excluding the other interrelated risks. Hence, in the 1990s the focus shifted to an integrated perspective of risk management, which allowed a more comprehensive evaluation of different aggregated risks (Miller, 1992; Sabato, 2010).

The risk identification is a necessary condition for a sound and safe financial environment. However, there has to be stressed on the differences between risk and uncertainty. Dermine (2011) outlines that risk is the situation when the probability distribution of losses can be identified with relevant data, while in the case of uncertainty, the distribution of losses cannot be measured, as the situation being new, no relevant data are available. Another aspect of the risk management that is gaining the attention of the scholar is the link between risk management and firm performance.

Cheruyot *et al.* (2014) conducted a study on the effect of Safari Card system as a revenue risk management practice on financial performance of Kenya wildlife service on a sample of 296 drawn from 1,286 employees in the National Parks

where Safari card System is used to collect the Parks entry charges. The study relied on both primary and secondary data which was processed to answer the research objectives using a descriptive survey research design while data analysis was done using descriptive statistics and presented in frequency tables and charts. The relationship between Safari Card as a risk management practice and financial performance was tested using a regression model. The results show that introduction of Safari Card as a transactional risk reduction system by Kenya wildlife system increases its liquidity as a measure of financial performance. The idea of the study was properly conceptualized. However, the major deficiency of the study was that the study was not based on any theoretical framework. Also, the measurement of performance was limited to liquidity and working capital whereas other performance indicators were neglected.

Kittipat and Nopadol (2014) conducted a study of the relationship between a successful enterprise risk management system, a performance measurement system and the financial performance of Thai listed companies. The study was done by collecting data from persons directly involved with these two systems with a total of 101 respondents. The results of the study indicate that success of the enterprise risk management system and performance measurement system have a weak positive correlation with the financial performance of an organization as measured by return on assets (ROA), return on equity (ROE) and earnings per share (EPS). It does, however, prove to be essential that managers develop, improve and utilize both systems in order to gain a competitive advantage and sustain the growth of an organization. It was reported that out of 520 copies of questionnaire distributed, only 101 copies were retrieved which formed the basis for the analysis. The narrowness of research sample reduces the robustness of the study and also makes generalization questionable.

In a study by Junaidu and Sunusi (2014) on the effect of credit risk management (CRM) on the profitability of Nigerian banks with a view to discovering the extent to which default rate (*DR*), cost per loan asset (*CLA*), and capital adequacy ratio (*CAR*) influence return on asset (*ROA*) as a measure of banks' profitability. It was established that CRM has a significant positive effect on the profitability of Nigerian banks as indicated by the coefficient of determinations $R2$ value which shows the within and between values of 40.89% and 58.35% (which are impressive) while the overall $R2$ is 43.91%, indicating that the variables considered in the model accounts for about 44% change in the dependent variable, that is, profitability.

Furthermore, empirical evidence was also provided by Adeusi *et al.* (2013) through their study on the relationship between the risk management practices and financial performance of the listed banks in Nigeria with the use of a pooled secondary data over a period of 4 years where 10 banks were randomly selected from a total of 21

listed banks in Nigeria. The results revealed a statistically significant relationship between financial performance and risk management practices and thus recommends for an improvement in prudent risks management in order to protect the interests of investors and other stakeholders in the Nigeria listed banks.

In another study conducted in Ghana, Opoku (2011) documented a significant positive relationship between the risk management practices and financial performance of First Atlantic merchant Bank Ghana Limited (FAMBL). Also, the findings in Yahaya *et al.* (2015) on the analysis of risk management mechanisms and organizational performance in deposit money banks in Nigeria revealed that overall organizational performance was positively affected by the risk management mechanisms of the banks and its liquidity policies. However, a negative and insignificant relationship was found between the firm variables such as financial leverage, size and age of the bank and financial performance measure with return on equity and return on assets.

Also, on the global level, several empirical evidences have been documented on the relationship between the risk management practices and financial performance. For instance, Zubairi and Ahson (2015) examine the strength of linkage between current risk management practices and profitability of five Islamic Banks in Pakistan. In order to achieve the study objective, the risk management practices of five Islamic banks were studied and quantified over a period of seven years. The study uses both the primary (survey questionnaires) and secondary data (annual reports) to gather information. The link of these practices with the banks' financial performance after controlling for other internal and external determinants of profitability was analyzed by adopting an econometric framework. Estimating pooled regression and checking the reliability of the estimated model through Augmented Dickey-Fuller test, it was found that risk management framework had a statistically significant negative impact on profitability during the period under review.

In Serbia Pagach and Warr (2010) study the effect of adoption of enterprise risk management (ERM) principles on firms' long-term performance by examining how financial, asset and market characteristics change around the time of ERM adoption. With the use of a sample of 106 firms who announced the hiring of a Chief Risk Officer (an event frequently accompanied by adoption of Enterprise Risk Management) it was reported that some firms that adopted ERM experience a reduction in earnings volatility. However, their overall results fail to find support for the proposition that ERM is value creating because ERM adoption has no material change on a range of observable financial measures.

The United State study by Hussein and Karl (2013) investigated the impact of risk taking on bank financial performance during 2008 financial crisis. This study uses descriptive and inferential statistics to test the hypotheses over the four years,

2006-2009, that span the financial crisis. The sample consists of 74 bank holding companies (BHCs) in the United States with total assets near $5.8 trillion at the end of 2006. These large BHCs account for a substantial proportion (52%) of the total amount of banking assets in the United States. Each of these BHCs had total assets in excess of $3 billion at the end of 2006. However, the study found a significant relationship between BHCs' risk taking levels and their financial performance. BHCs with lower risk-taking levels were found to have higher average financial performance than BHCs with higher risk-taking levels from 2006 to 2009. The study's findings support the claim that risk affected the earnings of the BHCs during the financial crisis. The results suggest that risk taking contributed to the 2007-2008 financial crises, and that aggressive risk taking was an important contributor to the recent financial crisis. In this study, the financial performance of the banks was measured by the return on assets (ROA), calculated as the bank's total net income divided by its average total assets, and return on equity (ROE), calculated as the bank's total net income before extraordinary items divided by its average shareholders' equity but there was no clear documentation of the risk indicators in the study.

In a study conducted in Tehran, Ramazanali *et al.* (2014) examine the impact of financial pressures and risk management on financial performance of investment firms and banks using106 firms listed on Tehran Stock Exchange (TSE) for a 5-year period from 2006 to 2011 with both descriptive and inferential statistics. The results of their hypothesis testing showed that there is no significant correlation between risk and financial performance of investment firms. However, a significant correlation was found between financial constraints and financial performance of investment firms and banks. The short coming found in this study was that the study relied mainly on secondary data without considering the opinion of the stakeholders in the study. From the above, the following hypothesis emerges: Risk management systems have significant relationship with the firm financial performance in the Nigerian listed financial institutions.

3. Objectives and research methodology

The general objective of this study was to establish the relationship between the risk management practices and financial performance for the 21 listed banks in Nigeria leading to the specific objectives where the link between the risk limit setting, monitoring of adherence to the risk limit, review of risk policy, credit risk management, operational risk management, market risk management and financial performance (return on capital employed and earnings per share) were established. The study covered a period of ten year from 2005 to 2014. The ten year period was chosen primarily to cover the pre and post 2008 financial crises and the economic recession that followed. There are only 22 listed banks on the Nigeria stock

exchange. Considering the relative small size of this population, the decision to cover the entire population was made. However, one bank declined participation because of the internal restructuring being embark on. Therefore, the population is also the sample size for the study.

The three dimension of risk management investigated in this study in line with the provision of CBN revised guidelines, NDIC guidelines were setting of risk limit by the directors, risk adherence monitoring and risk review by the board of directors. According to OECD, (2014) risk management practices is the process by which a company manages the risks that it faces which involves three dimensions or steps. The setting of risk limit and control before the commencement of business to avoid excessive risk taking by the management and monitoring of adherence to this limit must be undertaking by the board of directors as well as periodic review of the risk policy of the company.

Therefore, to undertake a survey research on those three aspects of risk management, a structured questionnaire that drew largely from the OECD risk management guideline was administered to the chief risk officers and internal auditors of the 21 banks to arrive at a total of 42 respondents for the study. This approach was perceived necessary due to the inherent ambiguity observed in the previous research instruments (questionnaires) generally and low level of research efforts on this crucial topic. It also allowed the acquisition of relevant data on risk management through a series of logical questions independent of the opinions of the respondent institutions.

In addition to the survey data, time series data was collected from the audited financial statement of the listed banks to measure the effectiveness of risk management practices under the general heading of credit risk management, operational risk management and market risk management. According to Fatemi and Foolad (2006) credit risk is the risk of loss originated by a debtor's failure to pay a loan or line of credit. Therefore, in line with IAS 39 and IFRS 9, this study adopted incurred loss approach and the expected loss approach in the measurement of credit risk in which credit risk was taken as the natural logarithm of total bad debit written off by the bank for the period. Basel (2007) defines operational risk as the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events. In view of that, operational risk was measured using the natural logarithm of the sum total of both internal fraud and external fraud. Market risk on the other hand is the risk of asset valued change associated with systematic factor (Santomero, 1997). Thus, market risk was taken as the natural logarithm of the loss in cash flow or fair values of financial instruments.

To evaluate the financial performance, two measure of performance were considered in this study. They are return on capital employed and earnings per

share. ROCE and EPS are accounting and market-based measures of financial performance which will provide a comprehensive check for the results (Hanison & Hudalis, 2012; Ntim, 2012). ROCE is used to measure how a firm's profitability is relative to their capital which is the efficiency of management in utilizing the company's capital to generate earnings (Hanison & Hudalis, 2006). Similarly, earnings per share ratio (EPS ratio) measure the amount of a company's net income that is available for payment to the holders of its common stock (Miller & Triana, 2009). A company with high earnings per share ratio is capable of generating a significant dividend for investors which is the ultimate aim of many investors (Mehrani, 1999). Second, earnings per common share are usually the first financial ratio investors look at when analyzing a stock (Ongore, 2011).

Furthermore, data analysis was conducted using both descriptive and inferential statistics. In an attempt to determine the risk management practices that impact the financial performance in the listed Nigerian banks using the descriptive statistics, 5-Likert scale approach was used in the questionnaire. The higher the score, the greater the strength of the respondent's agreement with the adequacy of risk management practices implemented by their respective banks. The descriptive statistics of the time series data was also presented using mean, median, maximum, minimum and standard deviation. Inferential statistics includes the correlation analysis and regression analysis which enables the study to relate the risk management practices to the financial performance of the listed banks. The multiple regression models defining the linear relationship between the risk management practices and financial performance has been stated as follows:

$$ROCE = \beta_0 + \beta_1 RLS_t + \beta_2 RAM_t + \beta_3 RPR_t + \beta_4\ CRISK_t + \beta_5 ORISK_t + \beta_6\ MRISK_t + \varepsilon_t$$

$$EPS = \beta_0 + \beta_1 RLS_t + \beta_2 RAM_t + \beta_3 RPR_t + \beta_4\ CRISK_t + \beta_5 ORISK_t + \beta_6\ MRISK_t + \varepsilon_t$$

Where:

ROCE= Return on Capital Employed in time t
EPS= Earnings per Share in time t
RLS= Risk Limit Setting in time t
RAM= Risk Adherence Monitoring in time t
RPR= Risk Policy Review in time t
CRISK= Credit Risk
ORISK= Operational Risk
MRISK= Market Risk
β_0 = Represents the Constant
ε_t= is the error term assumed to be normally distributed with zero mean and constant variance.
β_1- β_6= Represents the Coefficient of the Independent Variables

4. Results and discussion

The results of the diagnostic test, descriptive statistics and inferential analysis results were presented in this section. The detailed interpretations as well as the discussion of empirical findings were also carried out in this section. The diagnostic tests carried out for this study includes the reliability test, autocorrelation test (also known as test for independence) and homoscedasticity test.

4.1 Reliability Test

Reliability test is an indication of the stability and consistency with which the instrument measures a concept and helps to assess the goodness of a measure (Miller & Triana, 2009). Therefore, in this study, Cronbach's Alpha which is a reliability coefficient was used to indicate how well the items in the set are correlated with one other. According to Sekaran (2008) the closer a Cronbach's Alpha is to 1 the higher the reliability and thus, a value of 0.7 was recommended. The reliability analysis was conducted for dependent variable, return on capital employed and earnings per share, independent variables which includes, risk limit setting and control, monitoring of adherence to risk limit and risk programme review. The findings as presented in table 4.1 indicated that return on capital employed produced a coefficient of 0.901, earnings per share had a coefficient of 0.701, while risk limit setting, risk monitoring and risk programme review produce a coefficient of 0.704, 0.793, 0.710 respectively. Since, all the items produced a Cronbach's Alpha greater than the minimum acceptable coefficient, the data collected can be considered reliable and therefore accepted for further statistical analysis.

Table 1. Reliability Test

	Variables	Cronbach's Alpha	No. of Items
1	Return on Capital Employed	0.901	5
2	Earnings per Share	0.701	5
3	Risk Limit Setting	0.704	5
4	Risk Adherence Monitoring	0.793	5
5	Risk Policy Review	0.710	5

4.2 Test for Autocorrelation-Durbin Watson Statistic for Return on Capital Employed and Earnings per Share

Durbin Watson Statistic was conducted to test for autocorrelation in the data collected before accepting it for regression analysis. According to Kothari and

Garg, (2014), Autocorrelation occurs when the residuals are not independent from each other. In other words, when the value of y(x+1) is not independent from the value of y(x). Therefore, the null hypothesis that there was no autocorrelation in the data collected for this study was tested with use of Durbin Watson Statistics. The results as presented in table 2 revealed that the Durbin Watson Statistics for lag 1 was 1.835524 with a p-value of 0.245 while the Durbin Watson Statistics for lag 2 and 3 were 1.883643 and 1.843001 with a p-value of 0.386 and 0.130 respectively. Since the p-value was greater than 0.05, the null hypothesis which stated that there was no autocorrelation in the data was not rejected.

Similarly, the results of autocorrelation test for earnings per share presented in table 3 revealed that Durbin Watson Statistics for lag 1 was 2.201917 with a p-value of 0.062 while the Durbin Watson Statistics for lag 2 and 3 were 2.141619 and 1.987443 with a p-value of 0.132 and 0.946 respectively. Since the p-value was greater than 0.05, the null hypothesis which stated that there was no autocorrelation in the data was taken to hold. The result implies that the residuals were independent from each other. Similarly, the rule of thumb which states that values of $1.5 < d < 2.5$ show that there is no auto-correlation in the data was satisfied by this result (Barley, 2009). It can therefore be said that the return on capital employed for year 2006 was not a function of return on capital employed for the year 2005. Return on capital employed for 2007 was also not a function of return on capital employed for 2006 and soon. In like manner, earnings per share for year 2006 were totally independent from earnings per share for the year 2005. Earnings per share for 2007 was also totally independent from earnings per share for 2006 and soon.

Table 2. Durbin Watson Statistics for Autocorrelation

Lag	D.W Statistics	P-Value
1	1.835524	0.245
2	1.896343	0.386
3	1.843001	0.130

Table 3 Durbin Watson Statistics for Autocorrelation

Lag	D.W Statistics	P-Value
1	2.201917	0.062
2	2.141619	0.132
3	1.987443	0.946

4.3 Test for Homoscedasticity- Bruisch Pagan Statistics for Return on Capital employed and Earnings per Share

Another assumption of linear regression analysis tested in this study was homoscedasticity which implies that the error terms along the regression line were equal. According to Barley (2009), the violation of homoscedasticity which is otherwise known as heteroscedasticity make it difficult to gauge the true standard deviation of the forecast errors, usually resulting in confidence intervals that are too wide or too narrow. Particularly, if there is increase in the variance of the error term over time, confidence intervals for out-of-sample predictions will tend to be unrealistically narrow. In that case, heteroscedasticity may also have the effect of giving too much weight to a small subset of the data (namely the subset where the error variance was largest) when estimating coefficients. Thus, to prevent such scenario when conducting a research, it is expedient to test for homoscedasticity before carrying out a regression analysis.

Therefore, this study tested the null hypothesis that the data collected was homoscedastic in variance using Bruisch Pagan test. The result of the test presented in table 4for return on capital employed revealed that the test statistics was 205.9717 while the p-value was 1 indicating that the data collected was not heteroscedastic in variance and thus necessitating the acceptance of null hypothesis that the data collected was homoscedastic in variance and can be relied on for regression analysis. The result of the test for homoscedasticity for earnings per share presented in table 5 revealed that the test statistics was 162.6865 while the p-value was 0.98 indicating that the data collected was not heteroscedastic in variance and thus necessitating the acceptance of null hypothesis that the data collected was homoscedastic in variance and can be relied on for regression analysis.

Table 4.Bruisch Pagan Test for Homoscedasticity

Test Statistics	Degree of Freedom	P-Value
205.9717	5	1.000

Table 5.Bruisch Pagan Test for Homoscedasticity

Test Statistics	Degree of Freedom	P-Value
162.6865	5	0.98

4.4 Descriptive statistics

The descriptive statistics for the primary data, time series data and financial performance indicators were presented in table 6. This includes the mean, median, maximum, minimum and standard deviation for the variables. Based on the survey result, the risk limit setting and control in the 21 listed banks in Nigeria produced a mean score of 4.28 with a standard deviation of 0.22 over a period of ten years implying more or less little variation in the board approach to the risk limit setting and control. It can also be inferred that virtually all the listed banks in Nigeria have a pre-determine risk limit put in place by the board of directors in line with the mission, vision and philosophy of those banks which probably enable the management to avoid excessive risk taking. Although, the board of directors were able to communicate their risk acceptance level to the management, but this was limited to credit risk alone whereas other important risk aspect such as operational risk and market risk were given little or no attention.

Concerning the risk adherence monitoring, the mean score was 4.31 while the standard deviation was 0.19 suggesting high degree of monitoring of compliance levels with risk limit by the management of the limited banks in Nigeria with a little variation across the year and the industry. The monitoring exercise was carried out by the board via its committees as indicated by the respondent and the published financial statements. The Risk Committees at the board level monitors the Group's plans and progress towards meeting regulatory Risk-Based Supervision requirements and migration to Basel II compliance as well as the overall Regulatory and Economic Capital Adequacy. The Group's Board of Directors has delegated responsibility for the management of credit risk to the Board Credit Committee. The Board Credit Committee considers and approves all lending exposures, including treasury investment exposures, as well as insider-related credits in excess of limits assigned to the Management Credit Committee by the Board.

Management Credit Committee therefore, formulates credit policies in consultation with business units, covering credit assessment, risk grading and reporting, collateral, regulatory and statutory requirements. The committee also assesses and approves all credit exposures in excess of the Managing Director's limit as set by the Board. The Asset & Liability Management Committee monitors the Group's standards and policies covering the various components of Market Risk. These include issues on Interest Rate Risk, Liquidity Risk, Investment Risk and Trading Risk. It ensures that the authority delegated by the Board and Management Risk Committees with regard to Market Risk is exercised, and that Market Risk exposures are monitored and managed within the company's acceptable risk limit.

Risk policy review produced the lowest mean of 4.17 with a little standard deviation of 0.14. This little standard deviation implies that the listed banks been a

highly regulated industry, the practices are more or less the same across the industry and years with a slight difference between the industry leader and others. Majority of the banks maintained an annual review of the risk policy. However, more frequent reviews were only conducted based on the opinion of the board, when changes in laws, market conditions or the group's activities are material enough to impact on the continued adoption of existing policies in the board level approach of providing a risk management framework to their respective banks

Table 6. Descriptive Statistics

	Mean	Median Max.	Min.	Std. Dev.
RLS	4.28	4.30	4.50	4.10	0.22
RAM	4.31	4.38	4.48	3.50	0.19
RPR	4.17	4.09	4.00	3.65	0.14
ROCE	0.51	0.545	0.81	0.04	0.23
EPS	0.73	0.59	6.31	-0.23	0.12
CRISK	354526	138844	781184	112460	2346
ORISK	1117378	813447	2771980	755109	2246
MRISK	134667	442339	675000	73196	215

4.5 Inferential statistics

This section establishes the relationship between the risk management practices and financial performance of the listed banks in Nigeria using correlation and regression analysis. The essence of correlation analysis in this study was to ensure there is no multicolinearity in the data while regression analysis was used to determine the impact of each explanatory variable on the dependent variables. Two ordinary least square regressions were carried out. The first one linked the risk limit setting, risk adherence monitoring, risk policy review, credit risk, operational risk and market with return on capital employed while the second regression linked the risk limit setting, risk adherence monitoring, risk policy review, credit risk, operational risk and market with earnings per share.

4.5.1 Pearson Correlation Matrix for Dependent and Independent Variables

Correlation matrix is used to determine the extent to which changes in the value of an attribute is associated with changes in another attribute. The correlation coefficient according to Kothari and Garg (2014) can range from -1 to +1, with -1 indicating a perfect negative correlation, +1 indicating a perfect positive correlation, and 0 indicating no correlation at all. Table 7 revealed that there was a significant positive correlation between return on capital employed and risk limit setting at 0.672, there was also a strong positive correlation between the return on capital employed and risk adherence monitoring at 0.626. Similarly, there existed a significant positive correlation between return on capital employed and risk policy

review at 697 as well as return on capital employed and marker risk at 0.660. The relationship between return on capital employed and operational risk on the hand was found to be negatively significant at -0.604. Finally, the correlation between return on capital employed and credit risk was 0.234.

From table 7, all the independent variables were found to have a positive correlation with one another. The highest correlation was found between the risk limit setting and risk adherence monitoring at 0.661, followed by the correlation between risk policy review and credit risk at 0.656. The relationship between the risk adherence monitoring and market risk was moderate at 0.416. The lowest correlation existed between the market risk and other independent variables.

According to Wong and Hiew (2005), the correlation coefficient value (r) ranging from 0.10 to 0.29 can be considered weak. Also, the correlation coefficient from 0.30 to 0.49 can be considered moderate while the correlation from 0.50 to 1.0 can be considered strong. In like manner, Field (2005) stated that correlation coefficient should not go beyond 0.8 to avoid multicolinearity. Thus, it can be concluded that there was no multicolinearity problem in this research since the highest correlation coefficient was 0.661 existing between the risk limit setting and risk policy review.

Table 7. Pearson correlation matrix for the variables

		ROCE	RLS	RAM	RPR	CRISK	ORISK	MRISK
ROCE	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	285						
RLS	Pearson Correlation	.672**	1					
	Sig. (2-tailed)	.000						
	N	285	285					
RAM	Pearson Correlation	.626**	.661**	1				
	Sig. (2-tailed)	.000	.000					
	N	285	285	285				
PRP	Pearson Correlation	.604**	.613*	.629**	1			
	Sig. (2-tailed)	.000	.000	.000				
	N	285	285	285	285			
CRISK	Pearson Correlation	.697**	.649**	.656**	.619**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
	N	285	285	285	285	285		
ORISK	Pearson Correlation	.234**	.263**	.160**	.277**	.222**	1	
	Sig. (2-tailed)	.000	.000	.007	.000	.000		
	N	285	285	285	285	285	285	
MRISK	Pearson Correlation	.660**	.508**	.416**	.393**	.557**	.154**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.009	
	N	285	285	285	285	285	285	285

**Correlation is significant at the 0.01 level of significance (2-tailed).

- *. ROCE-Return on capital employed, EPS-Earnings per share, RLS- Risk limit setting, RAM- Risk adherence monitoring, CRISK-Credit risk, ORISK-Operational risk, MRISK-Market risk

4.5.2 Regression analysis

Using ordinary least square, regression analysis was carried out to determine whether risk limit setting, risk adherence monitoring, risk policy review, credit risk, operational risk and marker risk have significant explanatory effect on the return on capital employed and earnings per share of the listed banks in Nigeria. The results of the regression of ROCE on explanatory variables were reported in table 8 while those of EPS on explanatory variables were reported in table 9.

The coefficient of determination, R-Square as presented in table 8 was 0.867 suggesting that the variables considered in this study accounted for about 87% of the variation in financial performance of the listed banks in Nigeria measured by the return on capital employed while the remaining 13% can be attributed to the other variables not captured by this study model. The overall probability is positive and significant at 1% level of significance.

Table 8. Regression Results for ROCE and Explanatory Variables

	R				R Square		
	.931				.867		
	Sum of Squares	Df	Mean Square	F	Sig.		
Regression	30255.981	6	6051.196	365.339	.000		
Residual	4637.702	204	16.563				
Total	34893.683	210					
	Unstandardized Coefficients		Standardized Coefficients		T	Sig.	
	B	Std. Error	Beta				
Risk Limit Setting	.248	.113	.287	2.196	.029		
Risk Adherence Monitoring	.155	.064	.175	2.429	.016		
Risk Policy Review	.089	.099	.093	0.903	.367		
Credit Risk	-.069	.096	-.075	-0.719	.473		
Operational Risk	.314	.119	.336	2.644	.009		
Market Risk	.135	.066	.155	2.026	.044		
Dependent Variable: ROCE							

Risk limit setting has a statistically significant and positive relationship with the return on capital employed and thus, necessitating the rejection of the null hypothesis that risk limit setting has no significant relationship with financial performance. The positive and significant relationship between risk limit setting and financial performance suggests that listed banks in Nigeria have put necessary safeguard in place to prevent excess risk taking by the management which positively impacted the financial performance. The findings agreed with those of

Nocco and Stulz (2006) that stress the importance of good risks management practices in maximizing the firms' value.

Similarly, the relationship between the risk adherence monitoring and return on capital employed produce a t-statistics of 2.429 and p-value of 0.016 which indicates a positive and significant relationship between the variables. This implies that adequate financial performance in the listed banks in Nigeria is associated with the management's ability to adhere to the company's acceptable risk limit. The results supports those of Ferguson *et al.* (2013) who argued that the failure of corporate organizations were caused by the excessive risk taking of the management without reference to the organization policy and culture on risk taking.

Consequently, an insignificant relationship was found between risk policy review, and return on capital employed. Also, credit risk has a negative and statistically insignificant relationship with return on capital employed. Although, the evidence is not strong enough for the rejection of the null hypothesis, the relationship implies that the management has not been prudent in the allocation of credit facilities to the bank customers that resulted in higher bad debt which adversely impacted the financial performance of the banks. This result is contrary to that of Boahene *et al.* (2012) who utilized regression analysis in an attempt to reveal the connection between credit risk and profitability of selected banks and established that credit risk components (non-performing loan rate, net charge-off rate, and the pre-provision profit as a percentage of net total loans and advances) have a positive and significant relationship with bank profitability.

Operational risk is significantly positively correlated with the return on capital employed, thus our hypothesis which predicts a significant relationship between the two variables can-not be rejected. This implies that a significant reduction has been recorded by the listed Nigerian banks in both internal and external fraud which contributed to an increased financial performance. The results corroborates that of Oyerogba (2014) who reported that the combined effect of the predictor variables (operational risk disclosure, financial risks disclosure and strategic risks disclosure) explains 65.5% of the variations in the performance of listed companies in Nigeria.

The relationship between the market risk and return on capital employed was positive and statistically significant producing a t-statistics of 2.026 and p-value of 0.044. The result suggests that market risk is closely related to financial performance. This result was in agreement with those of Costa-Rica, Epure and Lafuente (2012) that applied regression analysis to study the effect of market risk on bank performance and discovered that performance improvements led to

regulatory changes and that market risk accounts for differences in bank performance, while non-performing loans inversely affect efficiency and return on assets (*ROA*) and the capital adequacy ratio (*CAR*) has a positive influence on the net interest margin.

To further confirm the relationship between the dependent variable and independent variables, regression analysis was carried out using another financial performance indicator (Earnings per Share). The results of regression analyses presented in table 9 revealed a significant relationship between earnings per share and most risk management practices. Specifically, five indicators of risk management practices were found to be statistically significant with earnings per share four of which were in positive direction while the fifth variable has a negative relationship with the financial performance indicator. R Squared of the regression model was 0.392 indicating that 39% of the changes in financial performance were explained by the changes in the variables considered in this study while the remaining 61% of the variations were caused by other variables not captured in this study. The value of R Squared was considered acceptable in comparison to the findings of previous corporate governance literatures which includes Halme and Huse (1997) as 21.2%, Peters and Romi (2011) as 25% and Post (2011) as 24%.

From the results of the beta coefficients, risk limit setting was positively correlated with earnings per share. The coefficient was 0.335 while the t-statistics and p-value were 27.917 and 0.000 respectively. This implies that an increase in risk limit setting by one unit leads to an increase in earnings per share of listed banks in Nigeria by 34%. The findings agreed with those of AL-Ahmidu and Tukur (2014), results on risk management and firm financial performance in Nigeria for a sample of 74 firms quoted on the Nigerian Stock Exchange for the period 2001–2005 where a significant relationship was found between risk management and return on asset.

Similarly, the beta coefficient on risk adherence monitoring was positive and significant at 1% level of significance. The coefficient was 0.094 while the t-statistics and p-value were 2.611and 0.000 respectively. Thus, risk adherence monitoring was associated with an increase in earnings per share of the listed banks in Nigeria by 9%. This result was in line with *Clay et al.* (2013) who posit that adherence to risk limit benefit firms through greater access to financing, lower cost of capital, better profitability and increase the confidence of all stakeholders in the management of an organization.

In like manner, the results of beta coefficient on operational risk management also revealed that a statistically significant relationship exists between earnings per

share and operational risk management of listed banks in Nigeria. For instance, the beta coefficient was 0.079 indicating that 7% of the increase in financial performance of Nigerian listed banks can be attributed to the reduction in both internal and external fraud. This result was in affirmative with the postulation of Hackston and Milne (1992) that as investors look for emerging economies to diversify their investment portfolios to maximize returns, they are equally concerned about governance factors to minimize risks in these economies. Also, Clark theory of profitability link company's profitability to the management ability to prevent fraud through adequate internal control mechanism (Benson, 2005).

In addition, a significant negative relationship was found between earnings per share and credit risk management of listed banks in Nigeria as beta coefficient was -0.162 and t- statistic was -12.462 indicating management's inefficiency in the administration of banks credit facility. The result contradicts those of Ben-Naceur and Omran (2008) that reported that bank capitalization and credit risk have considerable and positive influence on net interest margin, cost efficiency, and profitability of banks. Similarly, a positive and significant relationship was found between the market risk management and earnings per share suggesting that listed banks in Nigeria are efficient in the cash flow management over the period of the study. Risk policy review revealed no significant relationship with financial performance.

Table 9. Regression Results for EPS and Explanatory Variables

	R			R Square		
	.626			.392		
	Sum of Squares	Df	Mean Square	F	Sig.	
Regression	1373.322	6	1373.322	182.261	.000	
Residual	2132.378	204	7.535			
Total	3505.700	210				
	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
Risk Limit Setting	.355	.012	.269	27.917	.000	
Risk Adherence Monitoring	.094	.036	.461	2.611	.000	
Risk Policy Review	-8.503	.000	-.016	-0.310	.757	
Credit Risk	-.162	.013	-.797	-12.462	.000	
Operational Risk	.079	.017	.185	4.638	.000	
Market Risk	.038	.013	.690	2.925	.004	
a. Dependent Variable: EPS						

5 Conclusion and recommendations

In this study, the strength of risk management practices by the 21 listed banks in Nigeria and their effects on the financial performance were investigated using descriptive and ordinary least square regression analysis. The study used both primary data generated with the use of a well-structured questionnaire and time series data for a period of ten years ranging from 2005-2014. While there were slight differences in the banks approach to risk management practices, majority of the sampled banks were found to have a strong risk management policy as disclosed in the financial statement. The result was not unexpected owing to the fact that the study used a highly regulated industry. Therefore, compliance with prudential guidelines and other regulatory guidelines was perceived to be responsible for the adequate risk management practices observed in the financial statement of the banks. Further study can focus on a less regulated industry to determine the firms approach to risk management.

Furthermore, the overall results of the regression analysis revealed that adequate risk management practices is essential for the long term survival of listed banks in Nigeria. The results also reveals the trend in risk management practices in other developing economy such as Ghana, Pakistan, Kenya, Thailand, Tehran and the current global practices in Serbian and United States as presented in the literature review. Generally, the strength of risk management practices has a positive and statistically significant impact on the financial performance. This result is somehow similar to that of Hussein and Karl (2013) that found a significant relationship between BHCs' risk taking levels and their financial performance. BHCs with lower risk-taking levels were found to have higher average financial performance than BHCs with higher risk-taking levels from 2006 to 2009. It however contradicts that of Ramazanali *et al.* (2014) whose hypothesis testing showed that there is no significant correlation between the management of risk and financial performance of investment firms.

Similarly, within the risk management practices, risk policy review has statistically insignificant relationship with the two measures of financial performance. Credit risk was negatively correlated with both return on capital employed and earnings per share. However, the relationship was insignificant for return on capital employed while a significant relationship was found for earnings per share. The remaining four independent variables have significant and positive relationship with financial performance and thereby lend support to Zubairi and Ahson (2015) who reported that risk management practices had a statistically significant positive impact on profitability. On the contrary, risk management does not matter to the firm performance in Thailand as Kittipat and Nopadol (2014) reported a weak correlation between the risk management practices and financial performance of an

organization, measured by return on assets (ROA), return on equity (ROE) and earnings per share (EPS). Given the findings of this study, we recommends that adequate risk management system should be put in place by the board of directors which should include the establishment of company's annual risk limit, risk appetite and risk strategy to curtail the excessive risk taking of the management. The system should be reviewed regularly to determine its adequacy, effectiveness and compliance level of the management with the risk management system.

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