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# Moderating Effects of Board Equity Ownership on the Relationship between Enterprise Risk Management and Firms Performance: Data Screening and Measurement Model

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## Abstract

The prime goal of this paper is to conduct a preliminary analysis on the data collected in respect of the effect of ERM practices in Nigerian financial industry for the purpose of structural equation modelling. For the purpose of this study, 231 questionnaires were distributed to various financial institutions in Nigeria out of which 163 questionnaires were retrieved and used for the analysis, making a total response rate of 70.56 percent. Non-response rate bias test, common method variance test, normality and confirmatory factor analysis were conducted to determine the fitness of the data for further multivariate analysis. Therefore, the findings revealed that the data is fit for structural equation modelling.

**Keywords:** Keywords: Enterprise Risk Management, ERM Success Factors, Board Equity Ownership and Firm Performance

## INTRODUCTION

Technological failure, high increase in fraudulent business practices, competitive pressure and increasing development of new commercial codes have raised concern about the need for companies to come up with strategies that will curtail the problem of business failure and improve performance. For business firms to remain competitive, they are expected to review regularly and develop new approaches that will improve their operational efficiencies (Spedding & Rose, 2008). Besides, they may require to examine new areas of emerging risk and develop a more robust risk management methodology. Given the complexities surrounding business enterprise, the effort to deal with risk exposures has become crucial to firms' survival (Boniface & Ibe, 2012). In fact, companies continue to face heightened instability from the effect of globalization, deregulations, and intensive competitions (Shecterle, 2010). As such, the failure of firms to be proactive in risk assessment, mitigation and control had resulted in poor firm performance.

Moreover, the majority of corporate bodies lacked the active strategies for identifying new business opportunities. In essence, a change in the customer expectations, engagement imperatives, performance measures, risk management methodologies, skills and competencies for a sound business performance have become necessary (Awoyemi, 2010). These challenges have brought the issue of risk management to the limelight (Rostami, Sommerville, Wong, & Lee, 2015). And in spite of the sophistication of modern business environment, firms are more than ever before getting more exposed to potentially destructive events that constrained high business performance.

In the case of Nigeria lamentably, the risk management approaches of the majority of financial companies did not progress commensurately to sustain the quick market growth (SEC, 2012). From 2008 to 2009, the Nigerian stock market lost approximately 70 percent of its value (IMF, 2013). Subsequently, from 2009 to 2012, the market capitalization of the financial institutions experienced an annual decline of 17.42 percent (SEC, 2012). Also, some financial institutions in Nigeria were involved in sharp business practices to fleece shareholders investments (Kuye, Ogundele, & Otike-Obaro, 2013; Sanusi, 2010). The CBN audit report classified eight banks in serious financial grief (Sanusi, 2010). In all these instances, inadequacies of the risk management programs were cited as the primary causes of poor firms' performance in Nigeria (IMF, 2013).

Further, the Nigerian business environment has become highly unpredictable rendering the traditional approach to risk inefficient. Traditional Risk Management (TRM) does not consider the interaction of numerous risks classes (Ghazali & Manab, 2013). In fact, scholars have argued that TRM does not provide an opportunity for firms to view risk across the entire enterprise (Moeller, 2011). Hence, it is often referred to as "*silo-based approach*". This deficiency has led to the emergence of Enterprise Risk Management (ERM) as a comprehensive risk management mechanism. Essentially, enterprise risk management (ERM) is a risk management strategy that covers a portfolio of risk issues that can be managed holistically instead of fragmented approach. It is an approach that enable companies to understand the interactions that exist between numerous types of risks (PricewaterhouseCoopers [PWC], 2008).

Consequently, studies have investigated the influence of ERM practices on firms' performance (Doherty, 2000; Hoyt, Moore, & Liebenberg, 2008; Manab & Ghazali, 2013; Manab *et al.*, 2010; Meier, 2000; Mikes & Kaplan, 2014). However, the findings have been mixed and inconsistent concerning the proposed

benefits of ERM to firm's performance (Abdullah *et al.*, 2012; Ballantyne, 2013; Bertinetti, Cavezzali, & Gardenal, 2013; Mikes & Kaplan, 2014; Togok, Ruhana, & Zainuddin, 2014). Acharyya, (2008) argued that the empirical contribution of ERM has remained untested due to lack of suitable frameworks. In similar findings, studies have further stated that the inconsistencies in the relationship between ERM and firm performance were due to the inadequate specification of ERM frameworks (Lundqvist, 2014; Mikes & Kaplan, 2014). In fact, there is relatively little empirical work validating these hypothesized benefits. Empirical studies conducted to date do not make a general statement about the benefits of ERM implementation (Beasley, Pagach, & Warr, 2008; Togok *et al.*, 2014).

The study is proposing a research framework that incorporate some key ERM success factors (i.e. risk culture, compliance, risk knowledge sharing, risk information system, innovativeness, staff competence, and leadership) into ERM framework to further enhance the robustness of risk management approach. Also, scholars such as Gordon *et al.*(2009) and Hafizuddin-Syah *et al.* (2014) suggested the inclusion of contingent variables to strengthen the relationship between ERM implementation and firm performance. Hence, in line with Baron and Kenny (1986), this study proposed board equity ownership as a moderating variable that could strengthen the relationship between ERM and firm performance. As such an initial data screening is, therefore, crucial for any multivariate analysis (Hair, Hult, Ringle, & Sarstedt, 2014). Hence, the prime goal of this paper is to present the results of the initial analysis to indicate the appropriateness of the data for structural equation modeling. The rest of the paper proceeds as follows: Section 2 explains the methods. The third section carries the finding of the preliminary analysis and section 4 concludes the paper.

### **Method**

The study will focus on the Nigerian financial industry. Specifically, the study will examine the influence of ERM framework and ERM success factors on the performance of firms in the Nigerian financial industry. It will further consider the incorporation of a moderating variable (Board Equity Ownership) that is likely to strengthen the relationship between ERM framework implementation and firm performance. The Nigerian financial sector being the hub of productive activity of the economy performs the vital role of intermediation, a provider of payment services and the fulcrum of monetary policy implementation (Olusegun, Ganiyu, & Oluseyi, 2013). The sector accounted for 61 percent gross financial assets of gross domestic product (GDP) in Nigeria (IMF, 2013). Also, the Nigerian financial sector had witnessed a series of economic reforms, which ranges from recapitalization, proliferation of corporate governance conventions to issues relating risk management frameworks (Iganiga, 2010). Besides, the collapse of the global financial sector in 2008 had further exposed the susceptibility of Nigerian financial industry due to poor risk management practices. The population of the study comprises the six segments of the Nigerian financial sector (banking, insurance, pension, mortgage, and microfinance companies). These six sections make a total of 270 firms (CBN, 2012). Based on Dillman (2007) formula and Krejcie and Morgan sample size table, the sample of the study is 159. The study design is quantitative, and SPSS statistical package v20 was used to screen and analyze the data. For a more reasonable response rate, the sample was increased by 50 percent (Salkind, 1997). As such, 231 questionnaires were distributed to various financial institutions. We used 163 questionnaires for the analysis, making a total response rate of 70.56 percent.

## **3. Results and Discussions**

This section explains the results of the preliminary finding:

### **3.1 Non-response Bias Test**

Non-response occurs in research surveys in a situation where the subject in a study sample does not respond. Okafor (2012) defined non-response rate as the failure of researcher to collect data from a sample unit in the target population. It is normal for researchers to experience this kind of problem (Greener, 2008). A situation like this could lead to nonresponse bias. Non-response bias refers to a situation where the answers of respondents differ substantially and meaningfully from those respondents who did not respond (Armstrong & Overton, 1977). They proposed a time-trend extrapolation method of comparing the early and late respondents. Tardy respondents portray similar features with non-respondents (Armstrong & Overton, 1977; Miller & Smith, 1983). It is important to note that the size of non-response rate may practically indicate the reliability and quality of data collected for research (Okafor, 2012).

Following Miller and Smith (1983) suggestions, this study categorized the respondents into two groups. Those who responded within 57 days are considered early respondents while those who returned later (after 57 days) are considered late respondents. One hundred and eleven (111) respondents (67.68%) responded within 57 days while the remaining 52 respondents (31.90%) responded after 57 days. Also, in spite of the high rate of response rate experienced in this study an analysis was conducted to determine the assumption of equal variance between the early and late respondents using the latent constructs. Levene's test for equality of variance

was used to determine the difference between the responses of the early and the late respondents. The latent constructs include ERM framework, ERM success factors (compliance, risk culture, risk management information, risk knowledge sharing, staff competence, organizational innovativeness and leadership factors), the moderating variable (board equity ownership) and the firm performance (financial and non-financial). Table 1 presents the results of independent-samples t-test.

Table 1

**Results of Independent-Samples T-test for Non-Response Bias**

Variables	Group	N	Mean	SD	Levene's Test for Equality of Variances	
					F	Sig.
RMF	Early Response	111	4.1391	.44883	.034	.853
	Late Response	52	3.9509	.40357		
BEO	Early Response	111	3.9022	.75075	1.101	.296
	Late Response	52	3.5247	.80933		
COP	Early Response	111	3.2723	1.23787	3.238	.074
	Late Response	52	3.2655	1.12999		
RMI	Early Response	111	4.3784	.50437	.306	.581
	Late Response	52	4.0962	.46218		
RMC	Early Response	111	4.2027	.36543	.002	.968
	Late Response	52	4.1563	.34556		
RKS	Early Response	111	3.9640	.51040	.100	.752
	Late Response	52	3.9115	.50938		
SCP	Early Response	111	4.0060	.63799	1.709	.193
	Late Response	52	4.1506	.57381		
OIN	Early Response	111	2.9225	.72968	1.790	.183
	Late Response	52	4.2038	.52914		
LFS	Early Response	111	3.3333	.80173	.439	.509
	Late Response	52	3.4207	.82472		
FFP	Early Response	111	4.2117	.41920	.005	.945
	Late Response	52	4.3013	.39197		
NFP	Early Response	111	4.1967	.42176	.232	.631
	Late Response	52	4.1154	.45678		

Note: RMF=Risk Management Framework, BEO= Board Equity Ownership, C O P =Compliance, RMI=Risk Management Information, RMC=Risk Management Culture, RKS=Risk Knowledge Sharing, SCP=Staff Competence, OIN=Organisational innovativeness, LFS=Leadership Factors, FFP=Financial Firm Performance, NFP= Non-financial Firm Performance

As indicated in Table 1, the Levine's test revealed that the responses did not violate the equality assumption of variance as the p-value for each of the latent construct is greater than 0.05 (Field, 2009; Pallant, 2011). Consequently, it can be concluded that non-response bias was not an issue in this research. Moreover, Lindner and Wingenbach (2002) asserted that studies with high response rate may not have the problem of non-response bias.

**3.2 Common Method Bias Test**

Empirical studies usually utilize a single survey source for both the endogenous and exogenous variables (Eichhorn, 2014). In most circumstances, the survey instruments subject respondents to some form of prejudice. In this study, the data on both the dependent and the independent variables were obtained at the same time (cross-sectional) with the same instrument, and this could create a common method variance problems. Common method variance (CMV) refers to the systematic error variance observed among variables through a single method and source (Richardson, Simmering, & Sturman, 2009). Hence, scholars have agreed that CMV constitutes major issues in behavioral research and need to be examined (Lindell & Whitney, 2001; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Hence, we conducted a CMV test to make sure that there is no variance in the observed scores.

We used Harman's single factor test suggested by Podsakoff and Organ (1986) to detect the presence of CMV among the study variables. Under this approach, exploratory factor analysis was conducted on the study

variables using unrotated factor to determine the number of factors that are necessary to account for the variance in the variables (Podsakoff *et al.*, 2003). The assumption is that if a significant amount of CMV exists, a single factor may account for most of the covariance in the predictor and outcome variables. In this study, Harman's single factor test was conducted on all the items (70 items) of the study. The results indicated that a single factor accounted for only 10.15% of the total variance. The problem of common method variance arose when a single factor among the variables accounts for more than 50% of the variance explained (Lowry & Gaskin, 2014; Podsakoff *et al.*, 2003).

### 3 Normality Test

Screening for normality is a critical step in almost every multivariate analysis (Hair *et al.*, 2010). Previous researchers do not seem to care about data normality since SmartPLS can handle non-normally distributed data (Reinartz, Haenlein, & Henseler, 2009). However, recent studies indicated that for a better estimation in SmartPLS, the data ought to be approximately normally distributed. Hair, Sarstedt, Ringle and Mena (2012) recommended that the need for research to perform normality test as highly skewed data can inflate the bootstrapped standard error estimate. Examining the skewness and kurtosis is one of the most efficient approaches to detect normality (Field, 2009; Pallant, 2011; Tabachnick & Fidell, 2013). According to Hair *et al.* (2014), the absolute value of skewness and kurtosis of greater than one are indicative of non-normal data. Also, some scholars have indicated that the value of skewness greater than 3 and Kurtosis value greater than ten may indicate a problem (Kline, 2011). Following Hair *et al.* (2014), the absolute values of skewness and kurtosis of all the items are less than one. The following diagram clearly indicated that the data is approximately normally distributed as all the bars on the histogram indicate some level of symmetry.

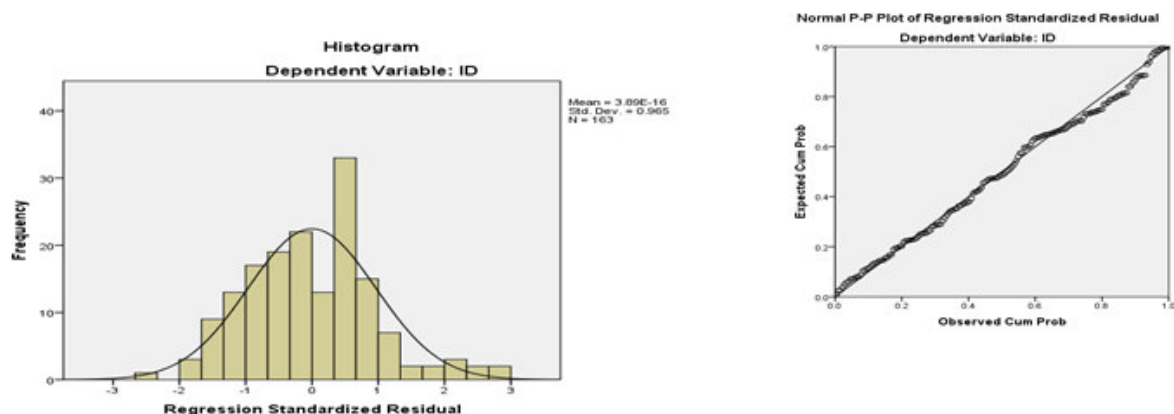


Figure 1  
 Histogram and Normal Probability Plots

### 3.4 Multicollinearity

Multicollinearity is a problem that arises in the correlation matrix when variables are too highly (i.e. 0.90 and above) correlated (Pallant, 2011; Tabachnick & Fidell, 2013). It refers to a relationship between two or more independent variables of sufficient magnitude that has the potential of adversely affecting regression parameters. The presence of multicollinearity increases the standard error of regression estimates and makes the variables of interest insignificant. Hair *et al.*(2014) asserted that a multicollinearity among variables exists when the tolerance level is below 0.20, and the variance inflation factor (VIF) is above 5. Therefore, considering the tolerance and the VIF values for all the exogenous variables. Examining the correlation matrix revealed that none of the predictor variables are highly correlated.

Table 2

*Tolerance and Variance Inflation Factors (VIF)*

Latent Constructs	Tolerance	VIF
RMF	.965	1.036
BEO	.965	1.037
COP	.905	1.105
RMI	.871	1.147
RMC	.891	1.122
RKS	.799	1.251
SCP	.816	1.225
OIN	.948	1.055
LFS	.895	1.117

Note: RMF=Risk Management Framework, BEO= Board Equity Ownership, C O P =Compliance, RMI=Risk Management Information, RMC=Risk Management Culture, RKS=Risk Knowledge Sharing, SCP=Staff Competence, OIN=Organisational innovativeness, LFS=Leadership Factors, FFP=Financial Firm Performance, NFP= Non-financial Firm Performance

### **3.5 Cross Loadings, Convergent Validity Internal Consistency Reliabilities**

The first step in PLS-SEM is to assess the measurement model. It establishes how well the indicators (items) measures the respective constructs. Reliability and validity are the two primary criteria used in PLS-SEM to assess the outer model (Hair *et al.*, 2014; Hair, Ringle, & Sarstedt, 2011) We, therefore, conducted a preliminary analysis in SmartPLS 2.0 to ascertain the reliability and the validity of the model. We assessed the internal consistency reliability using composite reliability (CR). Traditionally, Cronbach's alpha is used in determining the reliability of measures based on the inter-correlations of the observed indicator variables. It assumes the indicators to have equal loadings on the construct. However, PLS-SEM prioritizes the indicators according to their distinct reliability (Hair *et al.*, 2014). The study used CR as a measure of internal reliability since it considers the loading of each indicator differently as against the Cronbach's Alpha.

The conclusion about the nature of the relationship among constructs (inner model) depends on the reliability and validity of the measures. According to Henseler, Ringle, and Sinkovics (2009), the threshold value composite reliability should not be below 0.6. Moreover, composite reliability value of 0.7 and above is most appealing (Hair *et al.*, 2012). The CR value ranges o.783 to 0.880. Again, convergent validity that measures the extent to which indicators correlates positively with alternative measures of the same constructs, average variance extracted (AVE) was used. For the indicators to achieve convergent validity, the AVE value of 0.5 and above is required. In this study, the AVE value ranges from 0.529 to 0.661. However, a number of items were deleted during the confirmatory factor analysis. Hence, analysis of the measurement model confirms that the survey items are reliable and valid.

Table 4  
 Reliability and validity of constructs

Constructs	Items	Loadings	AVE	Composite Reliability	Cronbach's Alpha
<b>BEO</b>	BEO2	.741	.539	.823	.715
	BEO4	.678			
	BEO6	.831			
	BEO7	.676			
<b>COP</b>	COP3	.637	.545	.826	.736
	COP4	.755			
	COP6	.777			
	COP8	.775			
<b>FFP</b>	FFP1	.698	.527	.817	.701
	FFP2	.761			
	FFP5	.723			
	FFP6	.721			
<b>LFS</b>	LF2	.757	.661	.853	.752
	LF3	.893			
	LF6	.783			
<b>NFP</b>	NFP2	.729	.530	.818	.705
	NFP4	.726			
	NFP5	.733			
	NFP6	.723			
<b>OIN</b>	OIN2	.724	.547	.856	.832
	OIN3	.672			
	OIN4	.899			
	OIN5	.597			
	OIN6	.772			
	OIN6	.772			
<b>RKS</b>	RKS1	.731	.529	.817	.718
	RKS3	.694			
	RKS4	.831			
	RKS5	.642			
	RKS5	.642			
<b>RMC</b>	RMC1	.750	.552	.880	.849
	RMC2	.792			
	RMC3	.830			
	RMC5	.681			
	RMC6	.703			
	RMC7	.689			
	RMC7	.689			
<b>RMF</b>	RMF6	.756	.548	.829	.725
	RMF7	.764			
	RMF8	.753			
	RMF9	.686			
<b>RMI</b>	RMI1	.532	.559	.783	.694
	RMI3	.716			
	RMI4	.940			
<b>SCP</b>	SCP1	.790	.570	.841	.748
	SCP3	.689			
	SCP4	.770			
	SCP4	.770			
	SCP5	.768			

Note: RMF=Risk Management Framework, BEO= Board Equity Ownership, C O P =Compliance, RMI=Risk Management Information, RMC=Risk Management Culture, RKS=Risk Knowledge Sharing, SCP=Staff Competence, OIN=Organisational innovativeness, LFS=Leadership Factors, FFP=Financial Firm Performance, NFP= Non-financial Firm Performance

#### 4. Conclusion

Missing values and outliers were well examined to ensure that the study meets the assumptions of parametric statistics. Various tests that include nonresponse bias test, common method variance test, normality test, multicollinearity, cross-loadings, convergent validity and internal consistency reliabilities have been conducted to ascertain the suitability of the data (Tabachnick & Fidell, 2013). Hence, the preliminary analysis has provided

the opportunity for checking and complying with the assumptions of structural equation modeling. Therefore, it can be concluded that the data was fit for further multivariate analyzes, including the assessment of the measurement and structural model as well as post hoc analysis

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