AN EMPIRICAL ANALYSIS OF THE DETERMINANTS OF ENTERPRISE RISK MANAGEMENT ADOPTION AMONG NIGERIAN PUBLIC LISTED FIRMS

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Abstract

Enterprise risk management (ERM) is a widespread technique that integrates various methods in evaluating and minimizing all risks confronting firms. The application of this holistic approach to a firm's complete risk outlook includes strategies and processes used by firms to manage risks and seize opportunities that arise in achieving firm's objectives. Despite the recognition of the benefits of ERM implementation with enhanced organization performance, many firms are yet to adopt ERM in Nigeria as there are few of such studies that have investigated the drivers of implementing ERM framework. This study therefore considered the common factors responsible for ERM framework adoption by Nigerian public listed firms using logistic regression. The result shows that size of firm, firm industry, firm complexity, the independency of board directors, using one of the big Four auditor and multinational diversity are significant factors of ERM framework implementation among public listed firms. The findings of this study has practical relevance for practitioners as it suggest that when deciding whether or not to apply ERM, businesses should examine both internal and external issues to identify which firm-specific factors necessitate the use of an ERM framework.

Keywords: Enterprise Risk Management, Traditional risk management, Adoption, Silo approach, Public listed company.

1. INTRODUCTION

A growing interest regarding ever changing business environment is risk management and for firms, the challenge is to establish how much contingencies to take in face of uncertainty, as it aim to grow shareholders and firm's value. As the complexity of the marketplace varies continually for practically all businesses, it is becoming extremely difficult for firms to chart the correct path for sustainable survival (KucukYilmaz, 2009). Traditional method of managing risk view risks that exist in an organization on an individual basis. However, this silo approach has become outmoded as organizations now view risk management from a holistic basis, and not just the individual management of each risk. This non-silo method of handling risk in a firm is known as enterprise risk management (Liebenberg &Hoyt, 2003; Pricewaterhousecoopers, 2004; Gordon, Loeb &Tseng, 2009; Rochette, 2009; Hoyt &Liebenberg,2008; Razali, Yazid &Tahir, 2011; Woon, Azizan &Samad, 2011; Pagach & Warr, 2011; Lechner & Gatzert, 2017).

Enterprise risk management (ERM) is a widespread techniques and strategy that integrate various methods in evaluating and minimizing all risks confronting firms. These various methods include the strategies and processes used by firms to manage risks and seize opportunities that arise in achieving firm's objectives. ERM adoption is becoming more and more significant approach, particularly in contrast to the milieu of a growing difficulty of risks, greater than ever dependencies across risk lines, sophisticated method of identifying and quantifying risk, in addition to stringent set of laws as a result of the global economic crisis, amongst other factors (see for example, Hoyt & Liebenberg, 2011; Pagach & Warr, 2011; Lechner & Gatzert, 2017). The application of a holistic approach to a firm's complete risk outlook thus seeks to intensify the ability to create firm's shareholder value by ensuring proper scrutinizing and supervision of firm's total risk outlook (see, Meulbroek, 2002, Beasley, Clune &Hermanson, 2005).

Even though ERM is recognized as a very useful and essential technique that can be used in managing risk that surrounds organizations effectively, many firms are yet to adopt it despite the fact of its great slides lately and numerous studies have offered knowledge on drivers stimulating implementation of ERM by companies (see, Liebenberg *et al.*, 2003; Beasley *etal.*,2005; Gordon

et al., 2009;Pagach *et al.*, 2011). Extant studies have allied ERM implementation with enhanced organization functioning (for example, COSO, 2004; Gordon *et al.*, 2009, Fong-woon Lai, 2010; Hoyt *et al.*, 2010). Despite the benefits of ERM, many public listed firms are yet to adopt ERM in Nigeria as there are few of such studies that have considered the common factors responsible for firms adopting ERM framework. Firms must therefore understand the factors that influence ERM adoption so that proper processes and procedures may be implemented to ensure effective implementation. This research will look at the determinants of ERM adoption strategies in Nigerian public listed firms.

2. LITERATURE REVIEW

The concept risk has a variety of definitions, and it's crucial to prevent ambiguity when discussing it because it's a phenomenon that can't be avoided by definition or by nature. Uncertainty over a range of possible outcomes is one main view of risk; nevertheless, in many circumstances, uncertainty is a crude measure of risk, as it is vital to distinguish between upside and negative risks. The primary notion of ERM has been the holistic management of all risks, rather than the individual management of each risk, by analyzing risks uniformly across an organization (Sweeting, 2011). As the spotlight is equally on the upside and downside of the equation, this implies considering both diversifications and risk concentrations (Rochette, 2009).

Various definitions of ERM exist in the actuarial literature. For instance, ERM is seen according to Stokes (2004) and Woon *et al.* (2011) as a fundamental element of modern business due to change in its application from purely operational dangers and financial risks to an added tactical perspective of threats and opportunities. They acknowledge ERM as a comprehensive and dynamic risk management methodology that brings that bring to the fore the appetite for upside risk. ERM, according to Chapman (2003), is a technique of determining and analyzing risk from an integrated, enterprise-wide perspective while Liebenberg *et al.* (2003) opined that ERM offers firms a wider range of strategic and integrated approach to risk management. Many studies have provided insights on the elements that influence the adoption of ERM by businesses (Liebenberg & Hoyt, 2003; Beasley *et al.*,2005; Golshan &Rasid, 2012; Kanhai, & Ganesh, 2014; Lechner &Gatzert, 2017).

Given that various studies in the academic literature have linked implementation of ERM with improved firm value, the issue vis-à-vis the determinants arises, suggesting the likelihood of implementation for firms. With respect to this, most studies find a positive significant correlation concerning enterprise risk management and size of the firm (Beasley et al., 2005; Hoyt *et al.*, 2008, 2011; Pagach *et al.*, 2011; Farrell *et al.*, 2015). In addition, Hoyt and Liebenberg (2008, 2011) observe a substantial positive association concerning enterprise risk management and firms owned by other institution, which is in tandem with Pagach and Warr (2011) findings. Beasley et al. (2005) found the independence of board directors, as well as using one of the major four auditors to be relevant in adopting ERM concept. Golshan and Rasid (2012) using logistic regression concluded that been more leveraged and using one of the major four auditors have the greatest influence on ERM implementation. Similarly, Kanhai and Ganesh,(2014) examined the significant factors responsible for practicing enterprise risk management among banks in Zimbabwe using t-test and multiple regression and found three characteristics, namely adequate risk governance structure, organizational structure quality, and bank size, have a positive association with ERM adoption, whereas bank regulatory intensity has a negative link with ERM implementation. Furthermore, Razali et al. (2011) using data from the Malaysian bourse, demonstrate that being a multinational firm, volume of sales and the structure of capital are all important elements in ERM implementation.

Sae-lim (2017) employed mixed method in a preliminary study of preference for ERM and its determinants among listed firms in Thailand and concluded that leader role (degree of involvement and communication), organization context (i.e, size, level of risk culture and readiness of corporate strategies) and ERM resources (determined ERM mandate and the level of resources to ERM) are the major significant factors influencing ERM implementation. Consistent with the prior described empirical studies on the determinants of ERM adoption, this study will focus on the following firm characteristics (firm size, firm complexity, firm industries, international diversification, financial leverage, presence of a big four auditor, independence of board of directors, asset opacity, institutional ownership and return on asset) to influence the likelihood of ERM adoption.

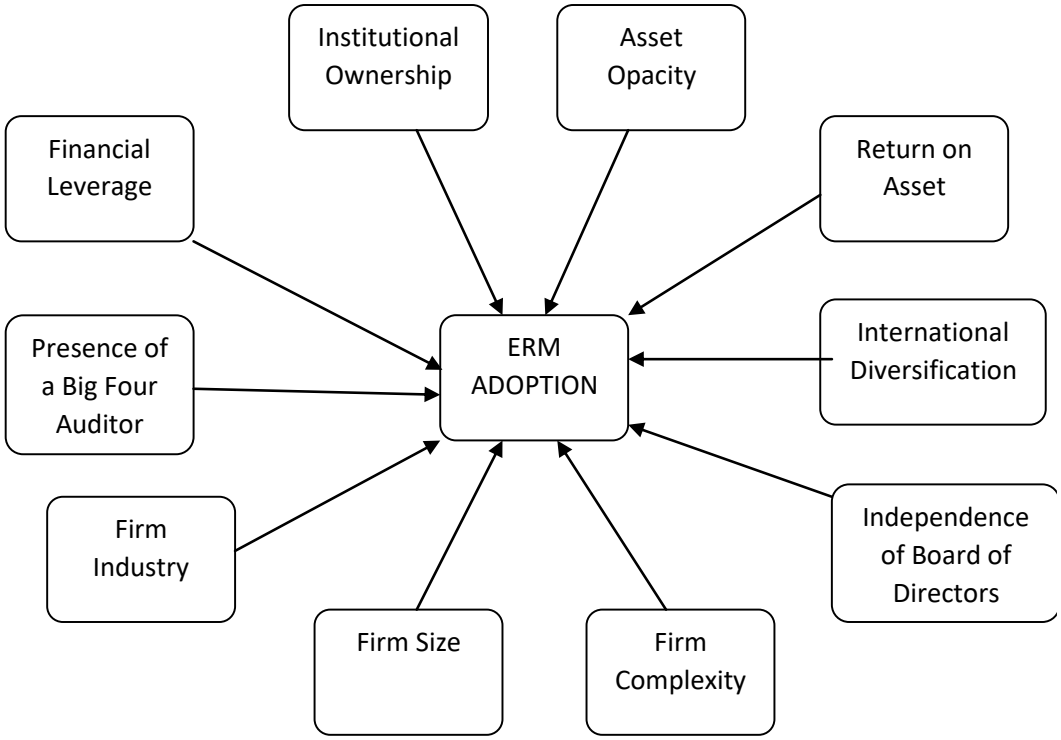

Figure 1: The conceptual framework

3. DATA AND METHODS

Data

The data used for this study were derived from the Nigeria Stock Exchange (NSE). The data set comprises of all 161 public listed firms in the main board of Nigeria bourse as at 2019 (NSE, 2019). Probing for several terms that signifies the implementation of ERM framework based on the studied literature was used to obtain the sample firms. Non-probability sampling that involves the sample being drawn from the part of the population that can be accessed was adopted as a result of certain limitations which include firms not publishing their 2019 annual report or does not disclosed the required information in their released annual report. A total of 116 businesses were found in the sample population (46 ERM adopters and 70 non-ERM adopters). The data needed to measure the variables in this study came primarily from the selected companies' annual reports.

Measurement Variables

Extant literature regarding factors influencing ERM adoption by businesses around the world have employed the appointment of a chief risk officer (CRO) as a proxy for adopting ERM in businesses (see: Daud, Yazid, & Hussin, 2010; Liebenberg, & Hoyt, 2003 and Pagach, & Warr, 2011). The argument for this proxy is hinged on the fact that most firms have a penchant to conceal comprehensive details regarding their risk management plans. Although, having a CRO has been noted by Beasley, Clune, and Hermanson, (2005) to be evidence of strong implementation of ERM framework between companies, the measurement employed in Gordon, Loeb, and Tseng, (2009) has been followed for a more precise measurement. The table below shows the measures that were used for the determinants studied in this work.

Methods

The effect of factors that influence ERM adoption among public listed firms was investigated using logistic regression. As a predictive model for data analysis (Hosmer & Lomeshow, 2004), logistic regression provides a means for modelling the reliance of a binary response variable over a categorical or continuous explanatory factors (Bewick, Cheek, & Ball, 2005). It explains the link connecting the independent variables as well as a dichotomous response variable (Friendly, 1995; Riley, 2006; Garson, 2006).

Table 1:Variables'Coding and Measures

VARIABLES	**MEASUREMENT**
ERM Adoption	Dummy variable ERM adopted=1 ERM not adopted=0
Firm Size	Ln(Total asset)
Firm Complexity	Number of segments
Firm Industries	Dummy variable banking, insurance, telecommunication and utilities =1 Otherwise=0
Country of domicile	Dummy variable HQ or Subsidiary in UK, Canada, UAE, Ghana, Gambia South Africa =1 Otherwise=0
Financial Leverage	Debt to asset ratio
Presence of a Big Four Auditor	Dummy variable Audited by KPMG, EY, PWC and Deloitte Touche =1 Otherwise =0
Independence of BOD (percent)	Number of independent members of the board/Total number of BOD*100
Asset Opacity	Intangible assets/ total assets
Institutional Ownership (percent)	Number of shares owned by institutions/ Total number of firm's share*100
Return on Assets	Profit after tax/ total assets

4. RESULT AND DISCUSSION

Descriptive Analysis of Data

The preliminary descriptive analysis of the data is presented in Table 2. The table presents a comparison of the variables between firm adopting ERM and those that do not adopt ERM in term mean differences, standard deviation, minimum and maximum value for the different explanatory variable.

Table 2: Descriptive Statistic

		ERM ADOPTERS				**ERM NON-ADOPTERS**			
Variables	**N**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**
Firm Size	**116**	21.48	29.79	25.48	2.37	18.59	28.05	23.00	2.07
Firm Complexity	**116**	1.00	6.00	4.63	1.61	1.00	6.00	2.61	1.25
Firm Industries	**116**	.00	1.00	.76	.43	.00	1.00	.27	.45
Multinational Firms	**116**	.00	1.00	.43	.50	.00	1.00	.23	.42
Financial Leverage	**116**	19.73	128.36	66.42	22.96	2.54	1955.71	95.71	236.73
Presence of Big Four Auditor	**116**	.00	1.00	.89	.31	.00	1.00	.41	.50
Independence of Board of Directors	**116**	.00	50.00	13.32	11.34	.00	50.00	7.26	11.49
Asset Opacity	**116**	.00	.13	.01	.03	.00	39.89	.59	4.77
Institutional Ownership	**116**	.00	94.49	48.77	25.14	.00	100.00	55.40	25.83
Return on Assets	**116**	.00	1.76	.07	.26	.00	.26	.04	.06

Independent sample T-Test

The significance of mean differences was investigated using a sample t-test, and the results are presented in Table 3. The results confirm the existence of a considerable difference between ERM and non-ERM adopters with respect to the size of an organization, the industry the firms operates, the number of business segment within a firm, the independency of the board of directors, engaging a big Four auditor and whether the organization is a multinational firm. This finding is in tandem with the result of Liebenberg *et al.* (2003), Beasley *et al.* (2005), Hoyt *et al.* (2008, 2011), Pagach *et al.* (2011) and Razali *et al.* (2011).

Table 3:Independent Samples Test

Variables	*N*	*t-test for Equality of Means*	
		t	*Sig. (one-tailed)*
Firm Size	116	5.973	.000
Firm Complexity	116	7.556	.000
Firm Industry	116	5.842	.000
Multinational Firms	116	2.385	.019
Financial Leverage	116	-.836	.405
Presence of a Big Four Auditor	116	5.795	.000
Independence of BOD	116	3.125	.002
Asset Opacity	116	-.826	.410
Institutional Ownership	116	-1.367	.174
Return on Asset	116	1.037	.302

Logistic Regression

Among the methods that have been used to investigate the factors influencing ERM adoption among firms is logistic regression (Kim & Yoon, 2004). It is used for testing the significance of the predictive power of each of the independent variable on ERM adoption among public listed firms. The regression result is presented in Table 4. The B values show the trend of the correlation of the different independent variable and ERM implementation. For the six statistically significant variable of ERM implementation among public listed firms (size of firm, firm industry, firm complexity, the independency of board directors, using one of the big Four auditor and multinational firm) there is positive relationship. It can be concluded from the result of the logistic regression that the size of the firm, the industry the firm operates, the number of business segment within a firm, the independency of the board of directors, having a big Four auditor and being a multinational firm are positively related to ERM adoption among public listed firms. This is in tandem with Liebenberg *et al.* (2003), Beasley *et al.* (2005), Hoyt *et al.* (2008, 2011), Pagach *et al.* (2011) and Razali *et al.* (2011).

Table 4: Variables in the Equation

Variables	Wald Statistic	B-Value	Sig. Value
Firm Size	21.278	0.504	0.00
Firm Complexity	29.724	0.855	0.00
Firm Industry	23.995	2.145	0.00
Multinational Firms	5.37	0.954	0.02
Financial Leverage	0.467	-0.002	0.49
Presence of a Big Four Auditor	21.198	2.45	0.00
Independence of BOD	6.865	0.045	0.01
Asset Opacity	1.039	-4.813	0.31
Institutional Ownership	1.848	-0.01	0.17
Return on Asset	0.748	1.37	0.39

5. CONCLUSION

The major rationale behind the study was to identify the key characteristics influencing ERM implementation among public listed companies in Nigeria. It can be concluded from the findings of this study that factors influencing ERM implementation are the size of the firm, the industry the firm operates, the number of business segment within a firm, the independency of board directors, having a big Four auditor and being a multinational firm. The logistic regression model was fitted and the result shows statistical significant association between the aforementioned six explanatory factors and ERM implementation. In tandem with previous findings, it is discovered that size of the firm size, industry the firm operates, firm complexity, the independency of the board of directors, presence of a big Four auditor and multinational diversity are the predominant variables.

It is reasonable that larger firms as well as multinational firms are motivated to employ a holistic framework for risk management due to growing number and difficulty of risks in addition to diverse state regulatory requirement. Furthermore, larger firms are more vulnerable to financial distress and more unpredictable operating cash flows, hence they are capable to commit bigger resources and employ ERM framework. Multinational firms that operate in more than one

country face various rules and regulations in different countries that compel them to adopt ERM framework because of their complexity and size. The verity that certain businesses are heavily regulated than the others is clear indication that businesses that operate in highly regulated trade has more tendency to employ holistic risk management framework. Hence, the industry that a firm operates in is a motivating factor for ERM adoption among firms. Similarly the rationale that appointing a Big Four auditor has a considerable impact on ERM implementation is hinged on the premise that the Big Four auditors have a duty to protect their reputation and will therefore take all required measures to certify that utmost quality financial reporting standards and regulations are adhered to. Also, the pressure of rules is a major motivator of various ERM implementations all over the world. As a result, the Big Four auditors are more liable to advocate the adoption of ERM framework to their clients.

Though this study contributes to existing knowledge by improving understanding concerning managing risk and the recently formed ERM strategy, it also has practical relevance for practitioners. The findings of this study can help ERM practitioners identify which firm-specific factors necessitate the use of an ERM structure. The findings of this study suggest that when deciding whether or not to apply ERM, businesses should examine both internal and external issues.

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