EFFECT OF RISK MANAGEMENT TECHNIQUES ON PERFORMANCE OF NON-BANKING FINANCIAL FIRMS IN NIGERIA

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Abstract

This study examined the effect of risk management techniques on the performance of insurance companies in Nigeria, as empirical studies in this area are seemingly insufficient for objective assessment and justification for continuous involvement in this core aspect of insurance strategy. The Structural Equation Model (SEM) of the primary data obtained from 41 randomly sampled insurance companies in Nigeria (Lagos State in focus) enabled the researchers to establish that the adoption of loss prevention and control; risk avoidance; and loss/risk financing as risk management techniques significantly enhanced positively the performance (proxy by underwriting profitability) of insurance companies in Nigeria. It should be noted, however, that the loss prevention and control

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technique of risk management commanded a higher positive correlation when measured against underwriting profitability than the other two techniques of loss/risk financing and risk avoidance. The study concluded that risk management techniques have positively and significantly influenced the underwriting profitability of insurance companies in Nigeria. It is recommended, therefore, that insurance companies in Nigeria should implement more preventive and control measures that will help to reduce the frequency of certain specific losses that could arise in the course of business.

Keywords: *Underwriting profitability, risk management techniques, Insurance company performance.*
JEL: G23, G32, G52

1.0 Introduction

In recent years, business organizations have experienced numerous obstacles in their operations and investment strategies, significantly impacting their profit margins (Sufian & Habibullah, 2009). When considering the risks that they cover, which are on the high side, insurance companies are not immune to the fall in profit margin. This tendency necessitates the creation of a new strategy or plans to address the current economic crisis confronting the business world. Environmental instability, strong competition, and the challenges of market liberalization, along with the occurrence of repeated financial crises, have prompted businesses to rethink their strategy in order to maximize profit and outperform other industry competitors (Njuguna, kwasira & Orwa, 2018). As a result, current tactics including the careful selection of securities to be included in an investment portfolio in order to successfully minimize risk exposure and maximize the portfolio's expected return are required (Kanini, Patrick & Muhanji, 2019). The current economic crisis, banditry, kidnapping, high rate of unemployment, cyber-crime, and the recent COVID-19 pandemic all

pose hurdles to the implementation of a modern plan. As a result of these issues, risk management has become a necessity for insurance firms, whose major mission is to limit risk faced by individuals and businesses.

Risk management requires developing an atmosphere that safeguards financial institutions against poor outcomes or risk exposure. It aims at assess the risks that individuals, corporations, financial institutions (both banking and non-banking), and public entities face in order to make recommendations on how to mitigate those risks (including risk transfer). This can be accomplished by categorizing events into one or more broad categories, such as market risks, credit risks, and operational risks; assessing risks using data and risk models; monitoring and reporting risk assessments on a timely basis; and employing risk management techniques to mitigate the risks' impact (Ebenezer & Omar, 2016). Documents and guidelines recommend that established risk management approaches should be employed on a continuous basis to increase performance and business profits because risk management is a never-ending process that comprises several steps (Kokobe & Gemechu, 2016).

Insurance firms are a bit of a riddle in that they handle both internal and external risks for individuals and businesses, and also have their own risks to manage (Olaiya, Arikewuyo, Sogunro, & Yunusa 2021). As a result, risk management and risk management approaches are critical to a company's ability to make sound decisions and perform successfully. Most risk management solutions deal with several types of hazards based on their severity which necessitates risk ranking and prioritization. Risks that may cause minor inconveniences are rated low, but risks that can cause catastrophic losses are rated high. As a result, it is critical to rank risks in order for the company to make informed decisions.

The profit that insurer derived from providing insurance or reinsurance coverage, exclusive of the income it derives from investment (Underwriting profitability), is a critical component that keeps a company running and gives it a competitive advantage over its competitors, since it is crucial to all stakeholders, investors, shareholders, and the economy as a whole. So far, investors are only concerned with the returns on their investments. Profitable businesses are economically and socially responsible because they create value, employ people, innovative, and also pay taxes (Odusanya, Yinusa & Ilo, 2018 as cited by Olaiya et al, 2021). An insurer faces numerous sorts of risk when carrying out their operations, which must be controlled by incorporating a robust risk management strategy into their system so that they can perform better.

Therefore, the goal of this study is to determine the effect of risk management techniques using loss prevention and control, loss financing, risk financing and individual risk avoidance on performance of insurance companies in Nigeria using underwriting profitability as measures of performance. The presentation of this research work is in five sections. The first Section introduces the subject matter of the study; the second section presents a review of literatures. The third section describes the research methodology employed for the study, while the fourth section focuses on research findings and the last section presents the conclusion and recommendations for the study.

2.0 Literature

Globally, insurance companies have experienced moderate returns and a sense of security. It has long been a favourite of investors seeking a piece of the financial sector without the dangers associated with investment firms or banks. The sector's diversification and subsidiary partnerships are also appealing to them. However, since the last quarter of the twentieth century, the insurance industry has changed, and it now offers an alternative to other high-growth financial stocks. Large

annuity contracts are now available, and insurance companies are opting for more sophisticated portfolios as their underlying capital basis. It is still unclear whether this is a successful transfer (Schich, 2010). But individuals and business organizations tend to reduce their loss by applying different risk management techniques which are mutually exclusive. They include loss prevention and control, loss financing and individual risk avoidance. The loss reduction aims at reducing the expected total loss by applying loss prevention as a method of reducing the severity of a particular loss and lowering the expected number of occurrences and loss reduction to reduce the severity of each loss that can be realize by reducing the level of risky activities through shifting to less risky product (Kiochos, 1997). This method remains a viable strategy for only small risks. Business organizations employ this technique if they discover that the cost of shifting risk to insurance companies is higher than the cost of absorbing the risk. They obtain financial resources to cover possible losses anyhow avoidable by retaining or self-insurance either through internal resources that consist of current cash flows produced by shareholders' capital and external financing (Olivieri & Pitacco, 2011). Risk that generates potential losses with a low frequency but a high severity or impact on the firm should be transferred to an insurance company and losses with high severity can be eliminated at any cost and refusing to undertake any task that could bring risk to the insurance company (Olivieri & Pitacco, 2011). An individual may decide to diversify his investment strategies that are related to risk by investing his small amount of wealth in a number of different stocks, rather than putting all of the wealth into one stock. Developing new products through diversification requires the financial institutions to adopt more technically advanced risk management techniques in order to sustain their competitiveness in the market (Ariffin & Kassim, 2009).

Risk managers must follow a specific process that includes identifying, analysing, evaluating, monitoring, communicating, treating, and

mitigating risks in order for risk management techniques to be more effective, resulting in increased underwriting profitability and improved performance of Nigerian insurance companies. (Saleem & Abideen, 2011). Identification of risk is the first and perhaps the most important step in the risk management process. Failure to identify the risk that an organization faces makes it difficult to apply other steps in the risk management process and manage potential risk(s) in the organization adequately. It is considered to be the most important step in the risk management process because it provides the foundation for the right future activities of the organization concerning the development and implementation of new programs for risk control (Tchankova, 2002). Identification is seen as a team effort which looks at project events with respect to various risk categories and extracts those which could have a negative impact on the project. Due to vast changes in the business environment, the risk identification process must be continuous (Russell, 2018). After the identification of risks, there is a need to assess the risks, which aims at expressing in quantitative terms the impact of the risk on significant target results in monetary terms or profits, and analysis is done to determine their characteristics and whether they are worth further analysis. (Ahmed, Kayis, & Amornsawadwatana, 2007; Olivieri & Pitacco, 2011). At this stage, each risk identified is ranked and prioritized. By doing so, it will help in better understanding of the possible impact of a risk or the likelihood of its occurrence (Yilmaz, 2019).

The evaluation stage usually depends on the number of risks. However, when there are only few risks then the evaluation stage might be lightweight, but, when there are much menace and the situation is complex, the evaluation becomes difficult. Moreover, in the evaluation stage, risk should be examined individually, as well as their combined impact on the project (Saleem & Abideen, 2011). Risk evaluation entails assessment of the level of damage so as to make decisions about further risk treatment. This involves comparing the

level of hazard, determined during the risk analysis and risk evaluation, with the defined risk criteria to prioritize the implementation of adequate measures for treatment and mitigating the risk (ISO, 2009).

The important result of the risk management process is the risk treatment. Risks that are worth of further investigation due to either of their relative importance or because of their high chance of occurring again are determined and treated by implementing a risk mitigation plan. Risks can be treated either through proactive approach or through reactive approach. Reactive approach refers to the actions initiated after the evaluation of the risks events while proactive approach refers to actions initiated based on chance of the occurrence of certain risks (Ariff et al, 2014). This is necessary to ensure that changing circumstances do not alter priorities, and to facilitate easy identification and treatment of new risks as they arise. It is, therefore, paramount to maintain adequate process records for monitoring and review purposes (Tularam & Attili, 2012).

Monitoring is an essential step in risk management process where risks are properly monitored, and the effectiveness of risk treatment plan is reviewed. Risks are needed to be monitored to ensure that changing circumstances do not alter the risk priorities. Some risks are likely to remain static, which require the risk management process to be performed on regularly bases, so as to capture new risks and effectively managed them (Moller, 2007). There is the need to communicate risk which is seen as an integral part of all risk management activities that take place at all stages of the risk management process. This entails engaging internal and external stakeholders through the risk management process. The framework promotes ‘consultative team approach’ in order to facilitate good communication with key stakeholders, from the outset (ISO31000:2009). In future, the face of risk communication will be

two folds: First, organizations have to expand their internal communication, secondly, the demands of external stakeholders will likely increase (Saleem & Abideen, 2011). Organizations must establish a proper communication strategy to support effective communication and consultation. Moreover, focus should be on consultations which make it important that shareholders must be communicated to throughout the risk management process and after that, their perceptions must be recorded which would be helpful in decision-making. It is necessary to ensure that changing circumstances do not alter priorities, and to facilitate easy identification and treatment of new risks as they arise. It is, therefore, paramount to maintain adequate process records for monitoring and review purposes (Tularam & Attili, 2012). This is an important step in the risk management process, during which hazards are appropriately monitored and the success of the risk treatment strategy is evaluated. Risks must be monitored to ensure that risk priorities do not shift as a result of changing circumstances. Some risks are likely to remain static, necessitating the risk management process to be repeated on a regular basis in order to catch new threats and manage them efficiently. (Chapman, 2001).

According to Olaiya, Arikewuyo, Sogunro, and Yunusa (2021), risk management plays a significant part in every organization's profit maximization through risk cost minimization for wise protection. Their findings, which were based on a well-structured 5-point Likert-scale questionnaire, Stata-SE 14 statistical software, and 120 questionnaires retrieved from respondents, revealed that risk reduction and risk monitoring have a significant impact on the profitability of insurance companies in Nigeria. They concluded that risk reduction and monitoring are critical in determining industry profitability, and that insurance regulators should work to ensure effective risk identification and evaluation in order to avoid financial crises and improve insurance performance.

Using data obtained from 51 insurance firms licensed to operate in Kenya as of 31 December 2020, Kiptoo, Kariuki, and Ocharo (2021) investigated the relationship between risk management and financial performance of insurance firms in Kenya for the period 2013–2020. Risk management has a considerable impact on the financial success of insurance companies, according to the results of regression analysis. Credit risk has a negative and considerable impact on financial performance, according to the researchers' conclusions. Firms having a higher percentage of non-performing receivables than total receivables are said to perform poorly. They went on to say that insurance companies should implement credit management systems to ensure receivables are collected on time, avoiding non-performing receivables, and so improving performance.

With a sample size of 19 enterprises, Fali, Nyor, and Mustapha (2020) analysed the impact of several forms of insurance-specific risks on profitability in Nigeria over a 10-year period (2009–2018). For independent variables, three variables were utilized as a measure of insurance-specific risk, such as re-insurance, technical provisions, and underwriting risks, while the dependent variable net profit margin, was employed as a measure of profitability. The results of the fixed effect regression model, which were based on secondary data gathered from companies' annual reports, revealed that technical provision and underwriting risks had a negative and significant impact on profitability, while re-insurance risk had a negative and insignificant impact. The authors concluded that increasing technical provision and risk underwriting will result in poor profitability for insurance companies listed in Nigeria, and that insurance companies in Nigeria should make adequate provision for outstanding claims by conducting an adequate assessment of their liabilities and also taking into account past experience to develop a comprehensive procedure for effectively monitoring and controlling their outstanding claims.

Kokobe and Gemechu, (2016) in their study showed that risk management practice and financial performance are not correlated. This opens a door for other problems on the application of the management techniques. Insurance companies should adopt enterprise risk management that is currently the best practice standard, and they should also apply risk management techniques effectively so as to improve on their return on equity and reduce loss ratios. Dabari and Saidin (2014) in their study mentioned that based on the extant literature, the implementation of risk management will improve performance and enhance shareholders value by identifying, evaluating, monitoring, and controlling all risks that can hinder the organization from achieving its set objectives.

3.0 Methodology

This study investigates relationship between risk management techniques and financial performance of non-banking institutions in Nigeria within agency theory and stakeholder theory frameworks. The study uses survey research design to achieve its objectives by focusing on insurance sector in Nigeria. Survey research is adopted due to its ability to provide certain information about population of the study through representation of lesser number of population members (Creswell & Eklund, 2006). According to Creswell, survey design procedure allows a researcher to collect data through an instrument (such as questionnaire) which can be analysed, and inferences drawn to provide answers to research questions and/or test theoretical postulations between two or more economic variables.

In the main, the population of this study comprised all non-banking financial institutions in Nigeria. However, the study specifically focuses on all insurance companies currently operating in Nigeria. The rationale behind the focus on insurance sector is premised on the role of the sector in ensuring protection and assurance for business and

investments continuity with resultant effect on economic growth of a country. In this regard, Nigeria insurance industry plays a significant role on economic growth and development of the country (Oke, 2012; Richard, & Victor, 2013; Ukpong & Acha, 2017; Nwafor, 2018; Iyodo, Samuel, Adewole & Ola, 2020). Consequently, the population of the study consists of all fifty-eight (58) insurance companies in Nigeria. National Insurance Commission (NAICOM) 2022 report states that 58 companies currently operate as insurance firms in Nigeria (GetInsurance, 2022). Out of these 58 fims, 46 of the insurance companies operate in Lagos State (Lawuyi, 2022)

Meanwhile, given the research strategy employed, this study uses all 46 insurance companies in Lagos State for effective responses to all the sensitive questions contained in the questionnaire. More importantly, Lagos State is selected due to the concentration of large number of big companies with most of their headquarters located in the state. With this 46 insurance companies, the study employed sample size determination formula developed by Krejcie & Morgan (1970) which was employed in Saka & Fatogun (2021). The outcome yielded forty-one (41) as efficient sample size.

The formula is provided as:

$$\boldsymbol{S} = \frac{\boldsymbol{X^2\ \ NP(1-P)}}{\boldsymbol{d^2\ (N-1)+X^2\ \ P(1-P)}} \ldots\ldots\ldots \text{(Krejcie \& } Morgan, 1970)$$

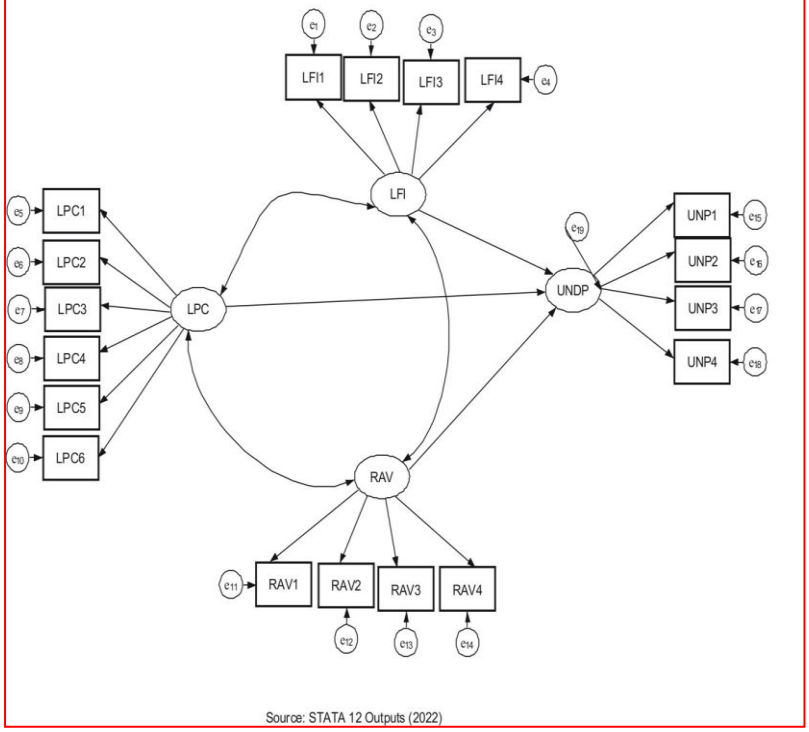
Where s = sample size (41); X^2 = table value of chi-square at 1 degree of freedom for desired confidence level (0.95); N = population size (46); and P = population proportion (0.5).

Simple random sampling technique was utilized to select 41 companies out of the final population (46) using Lottery design method. The sampling technique gives every insurance company in Lagos State equal chance of being selected for inclusion in the survey. The sampling frame from which the samples were selected consists of

risk officers from list of three (3) stratified groups including Chief Risk Officers, Strategic Risk Committee and Risk Managers of randomly sampled 41 insurance companies in Lagos State. One member from each stratum in each of the sampled companies was randomly picked. However, in a company with only one Chief Risk Officer, such officer is automatically selected for data collection. Consequently, a total number of one hundred and twenty-three (123) risk officers were obtained for opinion survey analysis. The selected risk officials from the sampled insurance companies form the units of analysis in this study.

Also, well-structured closed-ended questionnaire was physically administered for two days among the selected 123 risk officials who were previously sampled via simple random sampling in 41 sampled insurance companies. The purpose here is to collect and analyse cross-sectional data upon which inference would be drawn. The study develops Structural Equation Model (SEM, henceforth) on relationship between risk management techniques and financial performance of insurance companies in Nigeria. SEM model is required due to the large number of multiple variables involving latent and observed variables used to seek information on key dimensions of risk management techniques (that is, loss prevention and control, risk financing and risk avoidance) and underwriting profitability. The model is presented in figure 1:

Figure 1: Underwriting Profitability Measurement and Structural Models



Source: STATA 12 Outputs (2022)

From Figure 1, the following structural equation is formulated:

$$\boldsymbol{UNDP_i = \alpha + LPC_i + LFI_i + RAV_i + \varepsilon_i\ (Structural\ Model)} \ldots . (\mathbf{1})$$

Where:

UNDP = Underwriting Profitability;

LPC = Loss Prevention and Control;

LFI = Loss Financing (Risk Financing);

RAV = Risk Avoidance;

α = model constant;

ε = random error;

i = individual insurance company
(represented by sampled risk officers)

In addition to Structural Model in equation 1 which is helpful in testing hypothesised relationships, SEM also tests the reliability of observed variables in measuring the latent variables vis-a-vis measurement model (Corral de Zubielqui et al, 2019). However, it is constructive to note that only structural modelling of Figure 1 as illustrated in equation 1 was analysed since the focus is on estimation of relationships among constructs of the study which are loss prevention and control, risk financing, risk avoidance and underwriting profitability. Specifically, the study structural model was analysed through the use of maximum likelihood method depending on the outcome of multivariate normality informed by Mardia's multivariate Kurtosis (normal distribution) with all analyses performed at 5% level of significance.

4.0 Presentation, Interpretation and Discussion of Results

4.1 Presentation of Results

This sub-section presents the outcome of the data analysis for the study. The estimation results are presented in Table 1 below.

Table1: Underwriting Profitability SEM Results (Measurement and Structural)

Structural Equation Model — Number of obs. = 103
Estimation method = Maximum Likelihood
Log likelihood = -3143.4955

	Coef.	OIM Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
UNDP <-						
LPC	.7689147	.2602871	2.95	0.003	.2587613	1.279068
LFI	.0148532	.3366895	0.04	0.965	-.6450461	.6747524
RAV	.0736925	.1822811	0.40	0.686	-.2835719	.4309568
Measurement						
LPC1 <-						
LPC	.7215806	.1582596	4.56	0.000	.4113974	1.031764
_cons	2.912621	.1215067	23.97	0.000	2.674473	3.15077
LPC2 <-						
LPC	.8446617	.1318232	6.41	0.000	.5862929	1.10303
_cons	2.990291	.1289786	23.18	0.000	2.737498	3.243085
LPC3 <-						
LPC	.7081963	.1361851	5.20	0.000	.4412783	.9751142
_cons	3.07767	.1207397	25.49	0.000	2.841024	3.314315
LFI1 <-						
LFI	.7565021	.1389051	5.45	0.000	.4842531	1.028751
_cons	2.796117	.1235516	22.63	0.000	2.55396	3.038273
LFI2 <-						
LFI	.569514	.161646	3.52	0.000	.2526936	.8863344
_cons	3.067961	.1133919	27.06	0.000	2.845717	3.290205
RAV1 <-						
RAV	1.154333	.1585947	7.28	0.000	.8434933	1.465173
_cons	3.456311	.1504842	22.97	0.000	3.161367	3.751254
RAV2 <-						
RAV	.4443556	.1253895	3.54	0.000	.1985966	.6901145
_cons	3.864078	.1078228	35.84	0.000	3.652749	4.075406
UNP2 <-						
UNDP	.8600555	.2222411	3.87	0.000	.424471	1.29564
_cons	3.067961	.1389744	22.08	0.000	2.795576	3.340346
UNP4 <-						
UNDP	1.017253	.3355866	3.03	0.002	.359515	1.67499
_cons	2.854369	.134972	21.15	0.000	2.589829	3.118909

chi2_bs(153): 831.034 baseline vs. saturated (p > chi2: 0.0696)
RMSEA (0.04); CFI (0.951); SRMR (O.061)

Source: Author's Computation from STATA 12 Outputs (2022)

4.2 Interpretation and Discussion of Results

The information in table 1 reveals important statistics performed in this study. By description, the Table shows that data analysed are responses to 103 questionnaires administered. In the methodology section, it was stated that a total 123 questionnaires were administered among 41 randomly sampled insurance companies in Lagos State, Nigeria with 3 risk officials selected in each of the companies. The figure revealed in Table 1 indicates that the study analysed approximately 84% of the total information required. This rate is quite efficient and acceptable given the recommendation by Fincham (2008) that a response rate of $\geq$ 80% is expected and accepted for responses from a large population of individuals. According to Screiber *et al* (2006) and other scholars in SEM analysis, the conduct of SEM analysis is very sensitive to sample size adequacy and 10 observations per parameter has been recommended. Thus, the total number of 103 observations as analysed responses indicate that the study sample size is adequate.

Table 1 illuminates the results from measurement and structural models' estimation obtained via maximum likelihood method. From the Table, the researcher provides those observed indicators that show high factor loadings on their respective latent (or unobserved) constructs while those with low factor loadings are neglected. However, low factor loadings from measurement model are shown in the Appendix section (Table 2) along high loading factors. The factor loadings show how reliably and importantly an observed variable explains variation in the latent variable. In term of measurement model estimation, it is discovered through high factor loadings that large number of observed variables such as *LPC1* (0.72), *LPC2* (0.85), *LPC3* (0.71), *LFI*1 (0.76), *LFI2* (0.57), *RAV1* (1.15), *RAV2* (0.44), *UNP2* (0.86) and *UNP4* (1.02) as indicated in Table 1 (and Table 2, Appendix) significantly accounted for high proportion of variance in the study endogenous variables. This result shows that these observed variables effectively captured the variation in the constructs of the

study. It is important to state that the codes for both observed variables and constructs (latent factors) are provided in the Appendix section (Table 4).

Furthermore, structural model result indicates that all the risk management techniques adopted in this study have positive impacts on the underwriting profitability of insurance industry in Nigeria. That is, with 1 unit increase in the adoption of loss prevention and control, loss financing and risk avoidance as risk management techniques, the underwriting profitability of Nigerian insurance industry increases by 0.77; 0.01; and 0.07 respectively. However, the structural model estimation result further shows that loss prevention and control is the sole significant risk management techniques that affect financial performance of non-banking firms (specifically, insurance sector) in Nigeria. Again, the vast majority of good-of-fit indexes of the analysed SEM estimations such as Chi-square ($p>.05$: 0.0696); RMSEA (0.042) and CFI (0.95) as displayed in Table 1 and Appendix (Table 3) indicate that the study model fit the observed data. This is quite impressive and satisfactory; thus, provides easy possibility to make an informed inferential assertion.

In addition, the model standardized residual as captured by Standard Root Mean Square Residual (SRMR) with value of 0.061 indicates that the study model is well specified. The positive relationship found between loss prevention and control and financial performance of insurance companies in this study is consistent with findings by Kokobe & Gemechu (2016) and Fleming (2002). However, this current study obtained a higher positive correlation than Kokobe & Gemechu (2016) study that was conducted among Ethiopian insurance companies. Consequently, this study affirms that there is significant evidence of improved financial performance of non-bank financial firms (that is, insurance companies) with the adoption of loss prevention and control as risk management technique.

5.0 Conclusion

This study investigates relationship between risk management techniques and financial performance of non-banking financial firms with specific focus on insurance companies in Nigeria. The SEM analysis of primary data obtained from 41 randomly sampled insurance companies in Nigeria (Lagos State, in focus) enables the researcher to establish that adoption of loss prevention and control as risk management technique significantly contributes to enhanced performance of insurance companies in Nigeria. Such technique is strong and superior to any other risk management techniques (for instance, loss financing and risk avoidance) adopted among insurance companies in Nigeria.

RECOMMENDATION

The researcher recommends that insurance companies in Nigeria should implement more preventive measures that reduce the frequency of certain specific losses that could arise in the course of business.

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APPENDIX

Table 2: Measurement and Structural Models Estimation Results

Structural Equation Model Number of obs = 103
Estimation Method = ml
Log Likelihood = -3143.4955

	OIM				
	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
Structural					
UNDP <-					
LPC	.7689147	.2602871	2.95	0.003	.2587613 1.279068
LFI	.0148532	.3366895	0.04	0.965	-.6450461 .6747524
RAV	.0736925	.1822811	0.40	0.686	-.2835719 .4309568
Measurement					
LPC1 <-					
LPC	.7215806	.1582596	4.56	0.000	.4113974 1.031764
_cons	2.912621	.1215067	23.97	0.000	2.674473 3.15077
LPC2 <-					
LPC	.8446617	.1318232	6.41	0.000	.5862929 1.10303
_cons	2.990291	.1289786	23.18	0.000	2.737498 3.243085
LPC3 <-					
LPC	.7081963	.1361851	5.20	0.000	.4412783 .9751142
_cons	3.07767	.1207397	25.49	0.000	2.841024 3.314315
LPC4 <-					
LPC	.0686389	.1192797	0.58	0.565	-.1651451 .3024228
_cons	2.84466	.0987648	28.80	0.000	2.651085 3.038236
LPC5 <-					
LPC	.077029	.1619735	0.48	0.634	-.2404333 .3944913
_cons	2.883495	.1269602	22.71	0.000	2.634658 3.132333
LPC6 <-					
LPC	.1328092	.1437898	0.92	0.356	-.1490137 .414632
_cons	3.067961	.0993981	30.87	0.000	2.873144 3.262778
LFI1 <-					

LFI	.7565021	.1389051	5.45	0.000	.4842531	1.028751
_cons	2.796117	.1235516	22.63	0.000	2.55396	3.038273
LFI2 <-						
LFI	.569514	.161646	3.52	0.000	.2526936	.8863344
_cons	3.067961	.1133919	27.06	0.000	2.845717	3.290205
LFI3 <-						
LFI	.4493013	.2300052	1.95	0.051	-.0015007	.9001032
_cons	2.757282	.1080216	25.53	0.000	2.545563	2.969
LFI4 <-						
LFI	.2890821	.2246486	1.29	0.198	-.1512211	.7293854
_cons	2.825243	.1025675	27.55	0.000	2.624214	3.026271
RAV1 <-						
RAV	1.154333	.1585947	7.28	0.000	.8434933	1.465173
_cons	3.456311	.1504842	22.97	0.000	3.161367	3.751254
RAV2 <-						
RAV	.4443556	.1253895	3.54	0.000	.1985966	.6901145
_cons	3.864078	.1078228	35.84	0.000	3.652749	4.075406
RAV3 <-						
RAV	.2540205	.173431	1.46	0.143	-.0858981	.5939391
_cons	3.135922	.1016622	30.85	0.000	2.936668	3.335177
RAV4 <-						
RAV	.0525416	.2400766	0.22	0.827	-.4179999	.523083
_cons	3.184466	.0986688	32.27	0.000	2.991079	3.377853
UNP1 <-						
UNDP	1	(constrained)				
_cons	2.961165	.136327	21.72	0.000	2.693969	3.228361
UNP2 <-						
UNDP	.8600555	.2222411	3.87	0.000	.424471	1.29564
_cons	3.067961	.1389744	22.08	0.000	2.795576	3.340346
UNP3 <-						
UNDP	.8513599	.	.	.	.	.
_cons	2.893204	.1450109	19.95	0.000	2.608988	3.17742
UNP4 <-						
UNDP	1.017253	.3355866	3.03	0.002	.359515	1.67499
_cons	2.854369	.134972	21.15	0.000	2.589829	3.118909

```
-------------+----------------------------------------------------------------
Variance     |
          e.LPC1 |             1  (constrained)
          e.LPC2 |             1  (constrained)
          e.LPC3 |             1  (constrained)
          e.LPC4 |             1  (constrained)
          e.LPC5 |          1.654313   .2309932    1.258241    2.175063
          e.LPC6 |             1  (constrained)
          e.LFI1 |             1  (constrained)
          e.LFI2 |             1  (constrained)
          e.LFI3 |             1  (constrained)
          e.LFI4 |             1  (constrained)
          e.RAV1 |             1  (constrained)
          e.RAV2 |             1  (constrained)
          e.RAV3 |             1  (constrained)
          e.RAV4 |             1  (constrained)
          e.UNP1 |          1.292627   .2171334    .9300148    1.796622
          e.UNP2 |          1.529512   .2501164    1.110091    2.107402
          e.UNP3 |          1.715332          .           .           .
          e.UNP4 |          1.233131          .           .           .
          e.UNDP |          2.31e-17   .3449272           .           .
             LPC |             1  (constrained)
             LFI |             1  (constrained)
             RAV |             1  (constrained)
-------------+----------------------------------------------------------------
```

Covariance |
LPC |
LFI | .7023595 .2037498 3.45 0.001 .3030172 1.101702
RAV | .0840394 .1821145 0.46 0.644 -.2728984 .4409771
-----------+--
LFI |
RAV | -.3727135 .192515 -1.94 0.053 -.7500359 .0046089

LR test of model vs. saturated: chi2(145) = 788.32, Prob > chi2 = 0.0729

Source: STATA 12 Outputs (2022)

Table 3: Goodness-of-fit Indexes

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms (145)	788.318	model vs. saturated
p > chi2	0.000	
chi2_bs (153)	831.034	baseline vs. saturated
p > chi2	0.069	
Population error		
RMSEA	0.042	Root mean squared error of approximation
90% CI, lower bound	0.193	
upper bound	0.222	
pclose	-0.000	Probability RMSEA <= 0.05
Information criteria		
AIC	6374.991	Akaike's information criterion
BIC	6490.919	Bayesian information criterion
Baseline comparison		
CFI	0.951	Comparative fit index

	TLI	-0.001	Tucker-Lewis index
Size of residuals			
	SRMR	0.061	Standardized root mean squared residual
	CD	1.000	Coefficient of determination

Source: STATA 12 Outputs (2022)

Table 4: Codes for Observed Variables and Constructs

(a) Loss Prevention and Control (LPC)

S/N	Statements	CODE
1	Loss prevention and control as risk management techniques have a favourable effect on the underwriting profitability of insurance companies.	LPC1
2	Appropriate loss prevention method and control is a major factor that can affect the underwriting profitability of insurance companies.	LPC2
3	Loss prevention and control is one of the methods of reducing financial burden and increase underwriting profitability of insurance companies.	LPC3
4	Loss prevention and control enhance the underwriting profitability of insurance companies.	LPC4
5	The issue of loss prevention and control is taken with great consideration in our company to enhance underwriting profitability.	LPC5
6	There is the need for insurance companies to monitor and put proper risk control measures in place to enhance their underwriting profitability.	LPC6

(b) Loss Financing or Risk Financing (LFI)

S/N	Statements	CODE
1	The robust process for financing risk and monitoring each of the critical risks is essential to successful risk management and underwriting profitability of insurance companies.	LFI1
2	Risk management capabilities and financing must be improved continuously as the speed and complexity of business change so as to enhance underwriting profitability.	LFI2
3	Cultural issues and dysfunctional behaviour can undermine the effectiveness of financing risk management and lead to inappropriate risk taking or the undermining of established policies and processes.	LFI3
4	Lack of transparency, conflicts of interest, a shoot-the-messenger environment will encourage undesirable behaviour and compromise the effectiveness of financing risk management.	LF14

(c) Risk Avoidance (RAV)

S/N	Statements	CODE
1	There is a formal system of risk avoidance measure put in place in my organization.	RAV1
2	My organization follows a strict risk management process in order to be able avoid and immunized the adverse consequences of risk.	RAV2
3	My company has a dedicated chief risk officer, or its equivalent, in charge of risk management.	RAV3
4	Risk avoidance is considered as a value Centre in my organization	RAV4

(d) Underwriting Profitability (UNP)

S/N	Statements	CODE
1	There has been improved efficiency in our company's operations	UNP1
2	Financial statement analysis enhances risk management techniques.	UNP2
3	Proper monitoring and reporting of risk enhance financial performance of insurance firms in Nigeria.	UNP3
4	There is an improved level of innovations in my organization as a result of our risk management techniques.	UNP4

Source: Author's Compilation (2022)