



Sum Insured: A Missing Value Index In Performance Measurement In Non-Life Insurance Business Statistical Report In Nigeria

¹Olowoyo, Banji Jacob, ²Oluwaleye, Taiwo Olarinre & ³Ariyo, Clement Olugbenga

¹Department of Accounting, Banking and Finance, Oduduwa University, Ipetumodu, Ile-Ife, Nigeria.

²Department of Finance (Insurance Unit), Ekiti State University, Ado Ekiti, Nigeria

³Department of Finance (Insurance Unit), Ekiti State University, Ado Ekiti, Nigeria

Emails: ¹banjiolowoyo@gmail.com; ²taiwo.oluwaleye@eksu.edu.ng; ³olugbenga.ariyo@eksu.edu.ng

¹**Phone:** + 2348036544424

ABSTRACT

The importance of sum insured (value at risk) as the source of other variables that are used in the assessment of performance of insurance industry was identified. The difficulty of arriving at the actual value of sum insured was seen as a herculean task because of the assessment of physical properties using physical hazard and moral hazard. To the extent that presentation of two properties of the same value may not have the same premium. This research work identified that, as important as sum insured value is, it is not always reported in the statistics reports of insurance industry in Nigeria. The individuals and organizations that use insurance as a means of management of their risks, need a value like this to identify insurance companies that can manage their risks, by assessing the risk they shoulder, the premium collected, the premium paid, and the expenses incurred in their past records. This research provided a palliative solution to the issue of sum insured by using linear programming method to reverse the premium to estimated sum insured and applied regression analysis to show the relationship between sum insured and premium. It is evidenced from the analysis that the two variables were positively related, and it is recommended that the insurance company should always reverse their premium to provide estimated sum insured before submitting their statistical report to statistical departments. With this, stakeholders will be able to choose an insurance company that can effectively secure their properties by looking at variable indexes, such as sum insured, premium, claim payment and expenses at a glance of the statistical report.

Keywords: Sum Insured, Missing Value Index, Performance, Non-Life Insurance, Statistical Report, Nigeria.

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1. INTRODUCTION

Sum insured is a vital index in the processing of insurance premium and claims. The risk that is shouldered by insurance can be evaluated and evidenced by sum insured. The factors that are used for the assessment of sum insured are moral value of the insured and physical position of the property presents for insured. If two persons presents a risk of the same.



The premium charge may be different, by looking at the history of the insured and the accepted insuring habit he demonstrated in past and physical position of the insured risk. Stakeholders may find it helpful to know the capacity of the insurance company who will shoulder their risks subject to the value of the risk they accepted, premium received and claims resettled in their yearly report. Value at risk is an important index in the assessment of solvency of insurance firm and a hallmark in measuring performance in insurance business, as important as it is, almost always not contained in the annual report of insurance companies in Nigeria. The previous researchers globally such as (Itsu-Hua and Chen-Ying (2011), Madhu and Stanley, (2003), Marie and Cyrus (2014), Daniel and Tilalumu (2013), Tukur, and Bilikisu (2014) did not use it as one of their proxies in measuring the risks that can affect the performances of insurance firms such as (Retention Ratio, Earning assets, Loss ratio, expenses ratio etc.)?

Therefore the accuracy at which non-life insurance firms performance is being measured in Nigeria is faulted for lack of detailed data that are required for its assessment. What is responsible for this mainly is lack of including sum insured which is the source to all other variables such as premium, investment income, Claims payment and administrative expenses in the reporting documents that are usually submitted to statistical bodies such as Nigeria Insurer Association (NIA), Bureau of Statistics, Central Bank etc, that collates the statistical data of insurance activities in Nigeria. Also sum insured is not being used as one of the risk factors that can affect the outcome of insurance investment income such as (return on Assets, return on equity, growth of premium and Loss Rate). Chakvavarthy (1986) hinges performance on profit in financial market, satisfaction of stakeholders (such as policyholder, equity holder, government etc.) and the quality of the transformation that takes place in a firm. Nanni, Dixon and Vollman (1992) inferred that performance management is a way of setting direction and achieve it.

Neely, Gregory and Plants (1995) infer that a set of metrics can be used to balance performance. This study is an attempt to fill this gap by reversing premium to sum insured.

2. LITERATURE REVIEW

Ijiri (1975) describe performance an index of organization success or failure. Neely (1999) sees performance as a way of showing total quality management resulting to increase in productivity. Simon, Guetzskow, Kozmetsky and Tyndal (1954) asked the following questions to provide directions to how performance can be measured.

- a. How is a firm doing? This question can be answered by using performance evaluation.
- b. What problems should a firm look into? The answer is pointed out by the mile-stone that can be used to measure performance.
- c. Out of various ways of performing a job, which one is the best? This question seeks to know the best alternative of doing things through which performance can be measured.

In view of the above, importance of risk management to a corporate body and individual, the stakeholders who question the use of insurance as a way of managing their risk might seek\demand to know how to secure the magnitude of the risk insured with the premium being paid. This occasionally raise many questions in the mind of the users of insurance as a method of risk management.



To some it is a mystery, to insurers the analysis of performance of insurance companies has been very difficult and inaccurate because of methods of rating risk that produce premium. This may not produce the same premium. The research paper will analyze the importance of sum insured in measuring the performance of an insurance company and this will help the users of insurance to reduce their doubt on how insurance institutions manage huge risk, comparing with the ratio value of the premium they collect.

Insurance sector of economy is a crucial subsection of any economy and it plays an important role in economic development of a nation (Adeleye 2011): It requires capital for its transactions, not for produce tangible goods but to reduce the effect of inadequacy that premium collected and investment income may not cover while paying claims. Insurance activities, are subject to control by regulatory body (Adeleye 2012). Therefore, the risk(s) embarked on by an insurance company determines the capital requirement. This is the reason for relationships between capital and risks in insurance business transactions. Insurance, capital requirement is the basis for risk acceptance (Gbadamosi 2008).

2.1 Theoretical Review

Theories are a set to confirm the scientific procedures of how to approach a phenomenon and this is applicable to risk management concept that is practiced by corporate bodies.

Stakeholder Theory

Freeman (1984) inferred in his study of stakeholder theory, the interest of stakeholders in a corporate policy of an organization. He identify the following stakeholders in insurance firm, policy holders, employee debtors etc. Shapiro (1987) identified contractual agreement as underlying source of stakeholders in a business. Kilmezack (2005) opined the corporate risk management will reduce risk factors such as interest rate, inflation rate, foreign exchange risk and this will increase stakeholders' value.

Reputation Risk and Reputation Management Theory

Various reasons are attached to why reputation risk need to be managed and the reasons range from economic to strategic importance. It can be linked with the society expectation from the firm (Scott and Wcolshman, 2005). It results from the strategic approach of presenting the firms tangible benefits such as premium prices for products reduction in the cost of factors of production such as labour and capital, enhancing the loyalty of the employee and is being used for decision making by the managers (Little and Little 2000) Reputation can be seen as an approach by which a firm can manage the risk associated with quality of products and services (Scheizer and Wijnberg, 1999). With good reputation a firm can take good decisions and also withstand shock of corporate image risk (Fombrum and Van-riël, 1997) the above cited authorities is proof that outcome of identifying reputation risks and proffering appropriate risk management approach may edify a firm through financial performance, quality of management, social and environment responsibility performance, employee quality and the quality of goods and services provided.



3. METHOD

This research work made use of the least percent in each class of property insurance to reverse the premium generated, to calculate estimated value at risk, while comparing value at risk with premium received, claim paid, investment made, and reinsurance conduct etc. This research work made use of linear programmer techniques for the purpose of converting or reverse premium to value at risk in order to arrive at estimated value at risk

- i. Representation factors are represented as follows
 - a. Physical factors are represented by P. therefore P₁ (construction) P₂ (Environment) P₃ layout, P₄ (climate / weather conditionP_i
 - b. Moral factors, are represented by M: therefore M₁ (lifestyle), M₂ (age), M₃ (life History) M₄ (Claim History) M_i
- ii. Operation

$$G.P = S.I \times R$$

G.P = Gross Premium

S.I. = Sum Insured (Value at Risk) VaR

$$S.I = \frac{GP}{R}$$

If collectively applied

$$= S.I = \frac{G.P1}{R} + \frac{GP2}{R} + \frac{G.P3}{R} \dots \dots \dots \frac{G.Pn}{R}$$

$$\sum_{i=1}^n S.I = \sum_{i=1}^n \frac{GP_i}{R} \Rightarrow \sum_{i=1}^n S.I = \sum_{i=1}^n [GP_i R^{-1}]$$

Objective function Max fa. $= \sum_{i=1}^n [Gp_i R^{-1}]$

Subject to the following constraints

$$LR \leq R \leq MR$$

While LR = Least Rate
 MR = maximum Rate
 $H = \sum_{i=1}^n P_i$
 Physical

Gmoral = $\sum_{j=1}^n M_j$
 Multiple fn for n = fire, GI - T, Burglary etc.
 Max fn = $\sum_{j=1}^n [GP_j R^{-n}]$

Subject

$$C = H + G = \sum_{i=1}^n P_i + \sum_{j=1}^n M_j$$

$$= \sum_{i=1}^n [P_i + M_1]$$



The research fashioned out a means of making use of sum insured by providing estimated sum insured using the analysis of application of multiple linear regression to reverse premium to sum insured, to ensure that sum insured is one of the proxies that can be used to explain activities of insurance to the insuring public.

Note - If $S. I = \text{£ } GP/r$

While $S. I = \text{Sum Insured}$

$G. P = \text{Gross Premium}$

$r = \text{Agreed rate}$

Therefore $S. I = \text{£ } 5,000,000/0.01$
 $= \underline{\underline{500,000,000}}$

3.1 Reversal of Total Premium To Estimated Sum Insured (1986-2018)

$$S.I = GP/r = SI = GP/0.190$$

This table represents the reversed premium to estimated sum insured of Nigerian Insurance from 1986-2018 using multiple linear regression.

$S.I = GP/r$

$S.I = \text{sum insured}$

$G.P = \text{Gross premium}$

$R = \text{rate}$



TABLE 1: ANNUAL TOTAL PREMIUM AND TOTAL SUM INSURED OF NIGERIA INDUSTRY 1986-2018

YEAR	TOTAL PREMIUM	TOTAL SUM INSURED
1986	207,080.00	20,708,000
1987	351,416.00	35,141,600
1988	406,966.00	40,696,600
1989	570,722.00	57,072,200
1990	862,791.00	86,279,100
1991	1,162,807.00	116,280,700
1992	2,282,980.00	228,298,000
1993	3,719,119.00	371,911,900
1994	14,178,823.00	1,417,882,300
1995	13,074,762.00	1,307,476,200
1996	9,171,881.00	917,188,100
1997	9,477,676.00	947,767,600
1998	9,829,598.00	982,959,800
1999	15,018,787.00	1,501,878,700
2000	16,537,614.00	1,653,761,400
2001	24,595,268.00	2,459,526,800
2002	33,893,512.00	3,389,351,200
2003	43,104,387.00	4,310,438,700
2004	52,050,527.00	5,205,052,700
2005	58,191,285.00	5,819,128,500
2006	46,929,552.00	4,692,955,200
2007	77,929,843.00	7,792,984,300
2008	107,164,584.00	10,716,458,400
2009	121,497,064.00	12,149,706,400
2010	142,502,238.00	14,250,223,800
2011	144,233,474.00	14,423,347,400
2012	173,565,153	17,356,515,300
2013	178,150,381	17,815,038,400
2014	172,704,820.00	17,270,482,000
2015	168,625,364	16,862,536,400
2016	175,832,943	17,580,294,300
2017	441,001.65	44,100,165
2018	456,952.55	45,695,255
	1,818,721,371.20	181,869,137,420

Source: Author's computation 2019



Table 2: Data Analysis Presentation

<i>TOTAL PREMIUM</i>		<i>TOTAL SUM INSURED</i>	
Mean	44479126.71	Mean	4447948386
Standard Error	10639083.54	Standard Error	1063903129
Median	15419009.5	Median	1541900950
Mode	173150381	Mode	17315038100
Standard Deviation	56296738.46	Standard Deviation	5629646196
Sample Variance	3.16932E+15	Sample Variance	3.16929E+19
Kurtosis	0.458364991	Kurtosis	0.458387577
Skewness	1.319558859	Skewness	1.319569653
Range	172954687	Range	17295468700
Minimum	195694	Minimum	19569400
Maximum	173150381	Maximum	17315038100
Sum	1245415548	Sum	1.24543E+11
Count	28	Count	28

Source: Author's computation 2019.

4. ANALYSIS AND DISCUSSION OF RESULT

The Analysis of relationship between sum insured (VaR) and premium in determining effective risk management on the performance of Non-life insurance industry. The table above shows the descriptive statistics for total premium and total sum insured. The result revealed that the mean total premium is 44479126.71 with a standard deviation of 56296738.46. The mean total sum insured is estimated to be 4447948386 with a standard deviation of 562964196. Other measures of central tendency, measures of spread and measures of normality are also estimated in the table. For the measure of normality, the skewness and kurtosis value for both variables are relatively low which indicated that the data is not skewed. Assumption that the distribution of the independent variable and the target variable are similar as it is revealed by the above analysis as both variables are not skewed and this has covered better linear models.

5. CONCLUSION AND RECOMMENDATION

This study analyses the importance of sum insurance, as a vital variable that could give more credence like other variables such as premium, claims payment, investment and expenses values, which are normally used to measure the performance of insurance industry in Nigeria. The vital variables are almost always not reported in the statistical report of insurance companies in Nigeria. The insured generally will find it useful in assessing the insurance company that's capable of bearing their risks by looking at other performance variables including sum insured while making a choice of where to insure their risks.



The study applied multiple linear regressions to convert the premium paid to sum insured and regression analysis to analyze relationship between sum insured values and premium payment value, with the result indicated that both variables were similar.

In view of the findings of the study, the following recommendations are proffered:

- 1) The insurance association such as Nigerian Insurance Association(NIA), the body that is responsible for the processing of Insurance statistics, should enforce it on Insurance Companies to always include sum insured while submitting their annual reports
- 2) The national statistics bodies such as Central Bank National Bureau of Statistics should make it compulsory for insurance industry to always include sum insured as one of the variables in the statistical documents that are submitted to them.

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