Effects of assets liability management on the solvency margin of insurance companies in Nigeria

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Abstract

Asset and liability management is the strategic management of the balance sheet, for risk optimization of assets and liabilities taking into account all market risks. This is to ensure that the company's assets are not below its liabilities thereby making the organization financially viable. Asset-liability management serves as a cost /profit function which takes into account the assumed risk, level of earnings and liquidity of the bank. The study is an empirical investigation of the relationship between assets-liability management and solvency margin in the insurance companies. The data for the research were collected from the annual reports and financial statement of six insurance companies from 2006 to 2020 using the audited accounts of the selected companies. The sample size for this study consists of six insurance companies made up of two life assurance companies, two general insurance companies and two composite companies. The findings from the analysed data showed that the relationship between asset-liability and solvency margin of an insurance company in Nigeria, the analysis showed that there is a relationship between asset-liability and solvency margin of an insurance company in Nigeria. It also established that a positive Correlation between asset-liability and solvency margin with correlation coefficient of 0.995 which implies that there is strongly positive linearly correlation which is also significant between asset-liability and solvency margin. The analysed data showed that there is significant relationship between asset-liability management and a weak relationship between the liabilities of the companies and their solvency margin. This has a direct impact on the performance of the companies and by extension their abilities to meet their general obligations. Also the result from the t-statistics also reveals that the null hypothesis that the null hypothesis stating that poor asset-liability management will not affect the ability of insurance companies in complying with their statutory duty on solvency margin should be rejected.

Keyword: Asset, Liability, Insurance, Management, Solvency

Background to the study

Asset and liability management is the strategic management of the balance sheet, for risk optimization of assets and liabilities taking into account all market risks Rosen and Zenios (2006). This is to ensure that the company's assets are not below its liabilities thereby making the organization financially viable (Rosen and Zenios). Hence, Kusy and Ziemba (1986) were of the view that asset-liability management serve as a cost /profit function which takes into account the assumed risk, level of earnings and liquidity of the bank. Similarly, solvency margin is an important regulatory tool in the insurance industry and the regulators of the insurance industry paid much attention in the past to the necessary solvency margin required by insurance companies-

based risk theory (De Wit and Kastelijn, 1980). This is applicable in Nigeria as provided in the relevant law regulating insurance practice in the country (Federal Government of Nigeria, 2003). The solvency margin is determined in such a way that the probability remains under a specified norm with regards to factors like the type of insurance, size of portfolio, reinsurance etc., and that they play essential roles in the management of the insurance company (De Wit and Kastelijn, 1980).

The impact of poor solvency margin on the insurance industry and by extension the national economy of any country cannot be overemphasized. This is as a result of the fact that it reflects the state of the operators in the insurance industry in such an economy. Nevertheless, it is pertinent to note that from recent developments from the National Insurance Commission, the principal regulator of the insurance industry in Nigeria, many of the companies in the market have problem with their solvency margin (NAICOM website, 2020).

This means that these companies may not be able to meet up with the financial obligations such as liabilities to their insureds in the event of a loss, payment to their creditors involved with them in financial transactions and fulfilling their financial intermediation roles in the economy effectively. Poor assets – liability management could create a burden on the industry, especially as it affects the affected companies' solvency margins. The inability of a company to manage its assets vis-a-vis its liabilities may lead to some difficulties in maintaining its solvency margin as required by law.

The objectives of this study are to find out the relationship between asset-liability management and solvency margin of an insurance company; to examine the effects of poor assets liability management on the ability of an insurance company to meet its claim obligations to their insureds that had suffered a loss and to find out if Poor asset-liability management affect the ability of Nigerian insurance companies to comply with the regulatory solvency margin. Asset and liability management (often abbreviated ALM) is the practice of managing financial risks that arises from mismatches of the assets and liabilities in relation to a laid down investment strategy. It arises from the relationship between risk management and strategic planning and focuses on a long-term perspective rather than mitigating immediate risks. This way, ALM is a process of maximising assets to meet complex liabilities that may increase profitability. On the other hand, solvency has to do with the ability of a company to meet its long-term financial obligations. In this way, we can deduce that solvency margin means the ability of a company to have more assets than its liabilities, or the concept of assets being more than liability of a corporate entity.

Taking from the other way around, ALM could be described as the allocation and management of assets, equity, interest rate and credit risk management including risk overlays, and the calibration of company-wide tools within these risk frameworks for optimisation and management in the local regulatory and capital environment.

From the above definitions, we can deduce that asset liability management has a wider coverage of the issues pertaining to asset liability management than solvency margin. This is based on the fact that solvency margin is more concerned with the excess of assets over liabilities of a corporate entity to show that the entity is either solvent or insolvent. The asset liability management takes it farther by looking at the allocation and management of assets, equity, interest rate and credit risk management including risk overlays, and the calibration of company-wide tools within these risk frameworks for optimisation and management in the local regulatory and capital environment.

Nevertheless, while solvency margin approach is used in insurance regulatory framework, asset liability approach is used in the banking sector. By law, the assets of an insurance company as required exceed its liabilities. This is the basis of solvency margin. Research has shown that though there has been research on asset liability management in the banking industry, very little studies have been carried out on the relationship between assets liabilities management and solvency margin in the insurance industry much less the Nigerian insurance industry hence this paper attempts to identify the effect of poor assets-liability management on the solvency margin of insurance companies in Nigeria.

In view of the above, the Research questions and the hypotheses for this investigation are stated below:

(1) What is the relationship between good asset-liability management and solvency margin of an insurance company?

(2) What are the effects of poor assets liability management on the ability of an insurance company to pay claims?

(3) Does Poor asset-liability management affect the ability of Nigerian insurance companies to comply with the regulatory solvency margin?

1. Ho – There is no relationship between good asset- liability management and solvency margin of an insurance company

2. Ho – Poor asset -Liability management has no effect on the ability of an insurance company to meet its claims obligations

3. Ho – Poor asset-liability management will not affect the ability of insurance companies to comply with their statutory duty with regards to solvency margin.

Literature Review

There have been much studies on solvency assets and liability management from the banking sector than that of the insurance industry irrespective of the fact that it is as applicable to the insurance industry as it is to the banking sector. Augie (2018) notes that the solvency ratio of an insurance company is the size its capital relative to an all risk it has taken, adding that "it measures the extent to which assets cover commitments for future payments or liabilities. A stronger or higher ratio indicates financial strength. The ratio is calculated as the amount of Available Solvency Margin (ASM) in relation to the amount of Required Solvency Margin (RSM)." Augie (2018) further revealed that for instance, insurers are to maintain a minimum ratio of 1.5 or 150 percent. He also maintains that China's regulatory regime stated that insurance firms are required to maintain solvency ratios above 100 percent or be subjected to penalties on the scope of their business and financing activities". He added that the ideal ratio for Nigeria is 150 percent.

According to Joshi and Sontakay (2017) Assets-Liability Management (ALM) is a process of planning, organizing, controlling and managing various risks in an organization. ALM consisted of combinations of portfolio management techniques into a synchronized process in a coordinated management of an organization's entire balance sheet. They added that ALM helps an organization to focus on minimizing the risks and gaining maximum profit. Joshi and Sontakay (2017) further revealed that considerable work has been done by scholars under the sponsorship of the worldwide

Basel Committee, which is a committee of supervisory authorities that was established by the Central Bank Governors of 10 countries in 1988. Joshi and Sontakay noted that the first set of instructions focusing on minimum capital requirement for banks, which were known as Basel I was on credit risk. They added that in 2004 Basel II was introduced, which included instructions for capital adequacy as well as for risk management. Following the inadequacy of Basel II in 2008, there became the need to introduce Basel III with its main principle of encouraging more flexible banking system focusing on the four main banking principles that is: capital, leverage, funding and liquidity.

Similarly, Pragathi and Veera (2018) explained that assets liability management (ALM) is the management of infrastructural assets to minimize the total cost of owning and operating them while continuously delivering the service levels of customers' desire. Pragathi and Veena then noted that ALM is a comprehensive and structured approach to the long-term management of assets in the organization. This is more of a holistic approach in the balancing of assets and liabilities equation in the organization. Good management of assets and liabilities of a financial institutions either in the banking or insurance companies will enhance the solvency of these sectors. Experience from the banking industry would thus be beneficial to the insurance industry in their quest for managing their assets and liability so as to have a healthier solvency margin.

From the empirical perspective, Wike, Kpekpe & Nwonodi (2024) examined the relationship between assets and liability management and return on equity of quoted commercial banks from 2013-2023. Cross sectional data were sourced from annual reports of the quoted commercial banks and return on equity was proxy for dependent variable while liquidity management, assets management, liability management and credit management were proxies for independent variables. Panel data regression was used as data analysis methods. Findings of the study revealed that the fixed effect model shows that the independent variable explains 89 percent variation on the return on equity. The F-statistics and the F-Probability validated that the model is significant. The beta coefficient showed that all the independent variables have positive effect on return on equity except liquidity management. From the findings, the study concluded that assets and liability management had significant relationship with return on equity of the quoted commercial banks in Nigeria. The study recommended that regular review of asset liability management policies and tools should be done by the bank's board of directors to ensure that they were in line with market developments in Asset liability management process and should comply with cash reserve requirements, which helped them to avoid insolvency and maintain sustainability profitability. Although this study is on banking, it could be replicated in the insurance industry.

Similarly, Olowokudejo & Ukpong (20210 in a study used a panel data analysis of asset liability management and its effect on the profitability of life insurance companies in Nigeria and noted the inappropriate asset liability mix can be detrimental to the profitability of the organization. The objective of this study was to assess the relationship between assets, liabilities and profitability of life insurance companies in Nigeria. The ex post facto research design was adopted and cross sectional data was sourced from ten life insurance companies covering years 2008-2019. This study was based on descriptive analysis and inferential statistics and carried out to test the suitability of the data for the study. Data are further subjected to the fixed effect and random effect regressions. Hausman test was also carried out and the null hypothesis of a random effect model was rejected. The results revealed that assets largely have a statistically significant relationship with profitability, while some liabilities were significant. This provided evidence that profitability was associated with balance sheet items and a proper asset liability management had a direct effect

on the overall profitability of the life insurance industry. It therefore recommended that insurers should inculcate proper asset liability management policies and channel more of their resources to assets/liabilities which have the highest positive influence on profitability.

Theoretical Review

The Portfolio Theory which is more applicable in the banking sector than in insurance companies (Nzongang & Atemnkeng, 2006). According to the Portfolio balance model of asset diversification, the optimum holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial assets and the size of the portfolio. It implies portfolio diversification and the desired portfolio composition of commercial banks are results of decisions taken by the bank management. Furthermore, the ability to obtain maximum profits depends on the feasible set of assets and liabilities determined by the management and the unit costs incurred by the bank for producing each component of assets (Nzongang & Atemnkeng, 2006). Although asset-liability management is not a new planning tool, it has evolved from the simple idea of maturity matching of asset and liabilities of various time horizons into a framework that includes sophisticated concepts.

Both the liability management theory and the portfolio theory are relevant in the management of assets and liabilities of an insurance company so as to determine the solvency margin of such as the portfolio theory in particular helps in determining the profitability of a company, which may by induction determine the solvency of such company.

Methodology

The study is an empirical investigation of the relationship between assets-liability management and solvency margin in the insurance companies. The data for the research were collected from the annual reports and financial statement of six insurance companies from 2006 to 2020 using the audited accounts of the selected companies. The sample size for this study consists of eight insurance companies made up of two life assurance companies, four general insurance companies and two composite companies.

The random sampling was adopted as all subsets of the frame of the population of 51 companies were randomly selected as sample for the investigation. In this way, each element of the frame had a better probability of selection and the frame is not subdivided or partitioned.

The gross premium income, equity, balance sheet assets and liabilities of the selected companies from 2013 - 2017 were extracted from Secondary data of the Nigerian Insurers Association and used for the investigation. The data were complemented with that of direct extract from the Companies' Annual Reports and Accounts.

The main data collected were gross premium income, equity and liabilities, etc. were collected and presented using tables that showed the frequency of performance of the companies as extracted from the respective annual reports of the companies. The collected data was subjected to quantitative analysis. Thus, a correlation analysis was used to measure the strength of the linear relationship between asset-liability management and the solvency margin of insurance companies in Nigeria using the SPSS 21 as tool for the test.

Presentation And Analysis of Data

This section presents the analysis of data, interpretation of results and discussion of the research findings. The findings relate to the research questions and objectives that guided the study. The findings of the study were also discussed in relation to the literature and in comparison to other related works. The data collected cover the period from 2006 – 2020 and was analysed using descriptive and inferential statistics. Descriptive statistical is use to analysis the mean, standard deviation, minimum, maximum and skewness values of variables include in the model for the study. Inferential statistics such correlation and regression model analysis will be used to determine the relationship among the variables.

Diagnosis Tests

In order to ensure the integrity of the regression model and select an appropriate model for analysis, this study performed a range of diagnostic tests to verify that the assumptions of the regression model were upheld. Failure to adhere to these assumptions could lead to inefficient and inconsistent parameter estimates. The diagnostic tests included the coefficient of correlation test, normality test, heteroscedasticity test, multicollinearity test, and autocorrelation test.

Normality Test

The normality test was conducted using normality graph. The graphical method of normality test is important because it allows researchers to visually assess whether data follows a normal distribution. This is crucial because many statistical methods rely on the assumption of normality. By using graphical tools, researchers can identify deviations from normality and make informed decisions about the appropriate statistical analysis to use. Graphical methods for testing normality include QQ-Plot, PP-Plot, and the graph method proposed by Avram and Mărușteri (2022). These methods involve plotting data points against expected values under a normal distribution and examining the pattern of the plot. If the points fall along a straight line, it indicates that the data is normally distributed.

Test for Heteroscedasticity

A heteroscedasticity test was conducted to examine the assumption of constant variance in the residuals. The Modified Wald test was applied, with the null hypothesis positing that error terms possess a constant variance (homoscedasticity). A p-value ≤ 0.05 suggested that observations maintained constant variance, indicating the absence of heteroscedasticity.

Coefficient of Correlation

The study employed the Pearson coefficient of correlation (denoted as "r") to assess the strength of the association between sets of variables (Ratner, 2009), specifically examining the relationship between independent variables such as takaful premium affordability, takaful claims settlement, takaful Islamic principles, takaful risk management consultancy support, takaful customer service and support, takaful education and awareness initiatives, takaful technology integration, and the dependent variable, business performance. The correlation coefficient, ranging from -1 to +1, indicates the degree of correlation, with -1 or +1 signifying a perfect correlation and zero indicating no relationship.

Multicollinearity

The study utilized the Variance Inflation Factor (VIF) to assess multicollinearity, adopting a threshold of 6 as a rule of thumb. VIF values exceeding 6 indicated the presence of multicollinearity, following the guideline proposed by Field (2010).

3.12 Justification of Methodology Chosen

The justification of the chosen methodology is that it helps the researcher to collect relevant data from the respondents who could provide useful data for the study and it also helps in reducing errors that could occur if the wrong respondents are selected as samples for the study. And in using the SPSS in analysing the data more scientific results were arrived at for decision making, which in turn leads to more accurate results.

Table 1: Descriptive statistics of variables

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
ASSET-LIABILITY	15	113167745	170355118	139043890.73	21169472.496	.362	.580
SOLVENCY MARGIN	15	89783791	146411987	116113959.07	21847391.618	.360	.580
CLAIMS	15	22710355	23943431	23501412.33	396635.145	-.819	.580
Valid N (Listwise)	15						

Source: *Researchers field survey, 2024*

Descriptive statistics presented in table 1 revealed that average asset-liability in the study over the period covered is 139043890.73, standard deviation is 21169472.496, minimum and maximum values are 113167745 and 170355118 respectively; solvency margin for mean, standard deviation, minimum and maximum value are 116113959.07, 21847391.618, 89783791 and 146411987 respectively; claims for mean is 23501412.33, standard deviation is 396635.145, minimum and maximum values are 22710355 and 23943431 respectively; data skewness explain the normality of the variable used, which shows that all the variable fall within the range under the standard normal curve of ±1.96.

Analysis of Data

Table 2: Summary of correlation analysis establish the relationship between asset-liability and solvency margin of an insurance company in Nigeria

Correlations

		ASSET-LIABILITY	**SOLVENCY MARGIN**
ASSET-LIABILITY	Pearson Correlation	1	.995**
	Sig. (2-tailed)		.000
	N	15	15
SOLVENCY MARGIN	Pearson Correlation	.995**	1
	Sig. (2-tailed)	.000	
	N	15	15

Source: *Researchers field survey, 2021*

Table 2 presents a summary of correlation analysis that establishes the relationship between asset-liability and solvency margin of an insurance company in Nigeria. Table 2 revealed a positive Correlation between asset-liability and solvency margin with correlation coefficient of 0.995 which implies that there is strongly positive linearly correlation which is also significant between asset-liability and solvency margin. The finding implies that when there is increment or improvement in asset liability, the solvency margin will equally increase.

Table 3: Summary of simple regression analysis examine the effect of poor asset-liability on claims obligation of an insurance company in Nigeria.

Variable	B	S.E	t-statistic	P
POOR ASSET-LIABILITY	-0.0443	0.0049	-9.0408	0.0000
C	23263526.255	727262.220	31.9878	0.0000
R^2 = 0.8180; Adj R^2 = 0.8079; D W = 1.329				

Source: *Researchers field survey, 2021*

The simple regression model obtain is:

CLAIMS =23263526.255 - 0.0443*POOR ASSET-LIABILITY

Table 3 presents a summary of simple regression analysis examine the effect of poor asset-liability on claims obligation of an insurance company in Nigeria. R^2 is 0.8180 which indicates that about 81.8 percent of changes in claims obligations are explained by the poor asset-liability. The Durbin-Watson test value (1.329) revealed the present of positive autocorrelation. The t value of -9.0408 is significant at $p < 0.05$ and this shows that the equation has a good fit; that is, the explanatory variable is good explainer of change in claims obligation. The regression model above shows that a unit increases in poor asset-liability will reduces the claims obligations by 0.0443 and significant. The findings implies that poor asset-liability has significant effect on claims obligations as far as this study is concern, which is an indication that poor asset-liability management will always have a negative effect in meeting claim obligations of an insured by insurer.

Table 4: Summary of simple regression analysis examines the effect of poor asset-liability on solvency margin of an insurance company in Nigeria.

Variable	B	S.E	t-statistic	P
POOR ASSET-LIABILITY	-1.0260	0.0300	-34.3610	0.0000
C	26599078.186	4197997.082	6.3361	0.0000
R^2 = .9897; Adj R^2 = .9883; D W = 1.524				

Source: *Researchers field survey, 2021*

The simple regression model obtain is:

SOLVENCY MARGIN =26599078.186 -1.026*POOR ASSET-LIABILITY

Table 4 presents a summary of simple regression analysis examine the effect of poor asset-liability on solvency margin of an insurance company in Nigeria. R^2 is 0.9897 which indicates that about 98.9 percent of changes in solvency margin are explained by the poor asset-liability. The Durbin-Watson test value (1.524) revealed the present of positive autocorrelation. The t value of -34.361 is significant at $p < 0.05$ and this shows that the equation has a good fit; that is, the explanatory variable is good explainer of change in solvency margin. The regression model above shows that a unit increases in poor asset-liability will reduces the solvency margin by 1.026 and significant. The findings implies that poor asset-liability has significant effect on solvency margin as far as this study is concern, which is an indication that poor asset-liability management will always have a negative effect in achieving solvency margin of an insurer.

Conclusion and Recommendation

The findings from the analysed data are summarized as follows:

i. The correlation analysis established that the relationship between asset-liability and solvency margin of an insurance company in Nigeria, the analysis as in table 2 showed that there is a relationship between asset-liability and solvency margin of an insurance company in Nigeria. It also established that a positive Correlation between asset-liability and solvency margin with correlation coefficient of 0.995 which implies that there is strongly positive linearly correlation which is also significant between asset-liability and solvency margin.
ii. The finding implies that when there is increment or improvement in asset liability, the solvency margin will equally increase. This will help to improve the financial stabilities of these companies to meet their liabilities to their different stakeholders.
iii. Table 3 which is the summary of simple regression analysis examined the effect of poor asset-liability on claims obligation of an insurance company in Nigeria and revealed that there is an effect of poor asset-liability on claims obligation of an insurance company in Nigeria. R^2 is 0.8180 which indicates that about 81.8 percent of changes in claims obligations are explained by the poor asset-liability.
iv. The regression model above shows that a unit increases in poor asset-liability will reduces the claims obligations by 0.0443 and significant.
v. The findings implies that poor asset-liability has significant effect on claims obligations as far as this study is concern, which is an indication that poor asset-liability management will always have a negative effect in meeting claim obligations of an insured by insurer.
vi. Table 4 through the use of simple regression analysis examined the effect of poor asset-liability on solvency margin of an insurance company in Nigeria established that the effect of poor asset-liability on solvency margin of an insurance company in Nigeria. R^2 is 0.9897 which indicates that about 98.9 percent of changes in solvency margin are explained by the poor asset-liability.
vii. The regression model above shows that a unit increases in poor asset-liability will reduces the solvency margin by 1.026 and significant.
viii. The findings implies that poor asset-liability has significant effect on solvency margin as far as this study is concern, which is an indication that poor asset-liability management will always have a negative effect in achieving solvency margin of an insurer.

Conclusions

The analyses of the data presented as well as the reviewed literatures have shown that there is significant relationship between asset-liability management and a weak relationship between the liabilities of the companies and their solvency margin. This has a direct impact on the performance of the companies and by extension their abilities to meet their general obligations. Also the result from the t-statistics also reveals that the null hypothesis that the null hypothesis stating that poor asset-liability management will not affect the ability of insurance companies in complying with their statutory duty on solvency margin should be rejected. This means that poor assets- liability management could lead to negative solvency margin which will in turn affect the ability of the insurance company to meet up with its claims liability. This has been conformity with the position of Gour and Gaupta (2012) that the value of assets of an insurance company should exceed the value of its liabilities by a certain margin, otherwise known as the solvency margin. Also as stipulated by Alberti (2001) that solvency margin is one of the most important legal instruments for the protection of consumer is the requirement imposed on insurance companies. Little wonder then that there is regulatory provision of solvency margin in regulatory instruments for insurance companies.

The implication of this research to the insurance industry is that they should device a means through which they could determine the solvency margin in time before there is any requirement from the regulatory body for them to do so. This means that they should be working ahead of regulatory requirements in terms of provision of adequate fundings to ensure that their assets are far higher than their liabilities. This will no doubt help in helping them to determine their financial state of health without any compulsion by anybody to do so. Similarly, the relevant trade associations in the market should create and enlighten their members on the need for them to effectively manage their assets and liabilities in line with provisions of the relevant laws on insurance in the country. This will help in providing financial stabilities to the insurance companies so as to ensure that they could meet their liabilities to their different stakeholders especially the policyholders.

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