EFFECT OF CAPITAL ADEQUACY REGULATION ON THE FINANCIAL PERFORMANCE OF INSURANCE FIRMS IN NIGERIA.

BY

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Abstract

Given the higher risk environment within which Insurance firms operate, capital adequacy is critical in ensuring that Insurance firms have the capacity to withstand losses, underwrite risks and guarantee policyholders that all genuine claims will be adequately and promptly settled. Notably, the non- prompt payment of claims by some insurance companies in Nigeria has been attributed to the issue of low capitalization. Hence, insurance industry regulators have always placed great importance on monitoring the capital levels of insurance firms in order to set minimum capital requirements that would enhance the effectiveness of the industry. Therefore, this study examined the effect of capital adequacy regulation on the financial performance of insurance firms in Nigeria. The study adopted ex-post facto research design. The population of this study comprised all the 24 insurance companies listed on the Nigerian Exchange (NGX) from year 2013 to 2022. Out of this population, 15 insurance companies were sampled on the grounds that they have been listed on the Nigerian Exchange (NGX) throughout the period under consideration and also have complete data set for the periods of 2013-2022. Secondary data obtained from the annual financial reports and accounts of the 15 selected insurance companies was utilised and panel multiple regression was used to analyse the data. Based on the outcome of the Hausman specification test, the study adopted the Random effect regression and it revealed that core capital (tier 1 capital) has significant positive effect on financial performance of listed insurance firms in Nigeria while tier 2 capital has a negative insignificant effect on ROA. The study concluded that an increase in capital adequacy regulation will result to an increase in the financial performance of insurance firms proxied by return on assets (ROA). In line with the findings, the study recommended that the National Insurance Commission (NAICOM) which is Nigeria's insurance regulatory authority, should ensure that insurance firms adhere strictly to capital adequacy regulations by maintaining adequate capital to support their risk profiles.

Keywords: *Capital Adequacy, Regulation, Return on assets, Policyholders, Insurance firms*

1.0 Introduction

The Nigerian insurance industry which is responsible for developing policies and products that protect individuals and businesses against losses resulting from uncertainties and risks is an important and integral part of the Nigerian financial system. However, only a safe, sound and

stable insurance sector can guarantee protection of individuals and businesses from potential risks as well as contribute significantly to the nation's economic growth through the mobilization of domestic savings and generation of funds by way of premiums from policyholders. It will also provide financial stability; turn accumulated capital into productive investments; promote trade and commerce and generate employment opportunities. Notably, achieving a safe, sound and stable insurance sector requires effective regulation of insurance firms (Yensu et al., 2017).

In Nigeria, the National Insurance Commission (NAICOM) is the regulatory authority saddled with the responsibility of regulating the insurance industry with a view to ensuring that insurance firms perform optimally. The NAICOM in exercise of its statutory powers and regulatory functions, has over time devised different means in its quest to ensure that insurance firms in Nigeria have the capital capacity to carry the level of risk they bear. These efforts as demonstrated through various recapitalization attempts, are aimed at addressing the declining public confidence in the sector's integrity and ability to honour genuine claims by improving the financial stability of insurance firms. In 2003, the NAICOM which was established in 1997, unveiled the first recapitalization process which required insurance companies to have a minimum capital base according to the type of insurance they handled. It was required that Life insurance maintain a minimum capital base of ₦150m; General insurance, ₦200m, Composite insurance, ₦350m and Re-insurance, ₦350m.

In 2005, the insurance regulator introduced a new capital requirement which raised the minimum paid-up capital of Life insurance from ₦150m to ₦2 billion; General insurance from ₦200m to ₦3 billion, Composite insurance from ₦350m to ₦5 billion and Re-insurance from ₦350m to ₦10 billion. This recapitalization exercise which required insurance firms to adopt the merger and acquisition option eventually led to the consolidation of the Nigerian insurance industry in 2007 which saw the number of insurance companies reduced from 103 to 69 and Re-insurance companies from 5 to 2. In 2019, the NAICOM came up with another revised recapitalization guideline which raised the capital bases of life insurance business from ₦2 billion to ₦8 billion; general insurance business from ₦3 billion to ₦10 billion; composite insurance business from ₦5 billion to ₦18 billion and Reinsurance business from ₦10 billion to ₦20 billion.

Capital adequacy regulation is aimed at ensuring that the Capital Adequacy Ratio (CAR) of Insurance firms is enough to withstand losses, underwrite risks and guarantee policyholders

that all genuine claims will be settled as and when due. This will help to address the issue of apathy towards insurance due to lack of confidence in the sector, particularly in the ability of insurance firms to promptly pay genuine claims, thereby, helping insurance firms to retain their existing clients and attract new ones. This will increase the client base, premium income and underwriting profits of insurance firms, thereby stimulating favourable financial performance. Notably, capital is divided into Tier 1 and Tier 2 based on the function and quality of the capital. Tier 1 capital also known as core capital includes shareholder's equity and retained earnings which are disclosed on financial statements and is the primary way to measure the financial health of a financial institution. On the other hand, Tier 2 capital also known as supplementary capital includes revalued reserves, undisclosed reserves, and hybrid securities and is usually more difficult to measure.

However, an extensive study of literatures on regulation reveals that some theories are in support of regulation while others are against regulation. The positive and normative theories of regulation are the two basic theories in support of regulation. The positive theory of regulation which was propounded by Richard Posner in 1974, believes that government regulation is necessary for overcoming information asymmetries with the operator and aligning the interest of the operator with the interest of government. Similarly, the normative theory of regulation propounded by Sam Peltzman in 1976, is of the opinion that regulation encourages competition where feasible, minimizes the costs of information asymmetries by obtaining information and providing operators with incentives to improve their performance.

On the contrary, the bureaucratic theory and the monopolistic market regulation theories are against regulation of financial institutions. While the bureaucratic theory propounded by George Stigler in 1971, believes that regulation is sometimes misguided and its compliance causes unnecessary and long delays in decision making, the monopolistic market competition theory of regulation propounded by Chamberlin Edward Hasting in 1961, believes that regulation leads to suppression of competition thereby creating monopolistic or quasi-monopolistic results in the industry which in turn hampers financial performance of the firms operating in the industry.

In the light of the aforementioned arguments for and against regulation, the main objective of this study is to examine the effect of capital adequacy regulation on the financial performance of insurance firms in Nigeria. The specific objectives are to:

i. Determine the effect of Tier 1 (core) capital on the financial performance of insurance firms in Nigeria
ii. Examine the effect of Tier 2 capital on the financial performance of insurance firms in Nigeria

Consequently, the study was guided by the following research questions:

i. What is the effect of Tier 1 capital on the financial performance of insurance firms in Nigeria?
ii. To what extent does Tier 2 capital affect the financial performance of insurance firms in Nigeria?

Hence, the study tested the following hypotheses: H_{01}**:** Tier 1 capital ratio has no significant effect on the financial performance of insurance firms in Nigeria and H_{02}**:** Tier 2 capital ratio has no significant effect on the financial performance of insurance firms in Nigeria

2.0 Literature Review

The variety of meanings ascribed to the word regulation makes it pretty difficult for the term to be reduced to a single concept. In simple terms, regulation refers to the management of an activity according to a set of laws, rules and orders prescribed by authority. *It can also be viewed as* the promulgation of targeted rules, accompanied by some authoritative mechanism for monitoring and enforcing strict compliance. Regulation connotes the formulation of rules relating to a particular investment in order to protect consumers or investors; to ensure the solvency and financial soundness of financial institutions; to promote fairness, efficiency and transparency in the securities markets; and to promote a stable financial system (Albert & Ramadan, 2022).

Regulation according to Botha and Makina (2021) is a set of authoritative rules accompanied by a mechanism, usually a public agency, for monitoring and promoting compliance with those rules. Similarly, Klein (2018) posited that regulation is the practices established to control and manage an activity or process. In a similar view, Becker (2017) asserted that regulations are laws that have been put in place by the state to govern financial institutions such as banks and insurance companies. He further explained that these regulations are aimed at maintaining orderly markets, protecting clients and investors, granting licenses to the providers of financial

services, enforcing applicable laws, prosecuting cases of market misconduct and promoting the stability of the financial system.

This study defined regulation as rules, requirements, restrictions and guidelines put in place by a regulatory authority for strict compliance by the regulated entity in order to maintain the stability and growth of the regulated entity. This study further opined that maintaining efficient and stable insurance markets; ensuring a fair and safe market for profitable insurance business transactions and provision of adequate protection for policyholders are some of the imperatives for insurance regulation.

Capital Adequacy Regulation

Capital has been an important factor in any type of business from time immemorial as it shows how a business will operate in terms of maintaining efficiency and stability. Capital adequacy regulation refers to the minimum amount or level of capital set by regulatory authorities in order to ensure both the safety and soundness of financial institutions like banks and insurance companies.

Aruwa and Naburgi (2014) opined that capital is the cornerstone of a bank's financial strength as it supports bank operations and provides a buffer to absorb unanticipated losses emanating from its activities. In a similar opinion, Asikhia & Sokefun (2018) posited that capital adequacy is the amount of capital a bank or other financial institution has to hold in order to create a sound and healthy financial system as required by its regulator. According to Ikpefa (2018), capital adequacy is a regulated amount of capital base expected of financial institutions to effectively discharge their primary function by preventing failure through the absorption of losses. Similarly, capital adequacy has been described as the minimum amount that is necessary to boost confidence in financial institutions and effectively assist in preventing firm failure by absorbing losses without being strained into costly liquidation (Akintoye & Somoye, 2018).

Financial Performance

In simple terms, financial performance measures the extent to which an organization utilizes its resources optimally to generate value for stakeholders during a given period of time. According to Didin et al. (2018) financial performance refers to the ability of a company to manage and control its own resources. In their opinion, Fauzi et al. (2017), defined financial performance as the ability of a firm to effectively deploy its resources for the achievement or

realization of its goal. In a similar opinion, Abbas (2018) asserted that financial performance is the extent to which the company can achieve its objectives at the lowest possible cost.

In a similar opinion, Muturi and Njeru (2019) defined financial performance as a subjective measure of how well a firm uses its assets from its primary mode of business and generate revenues. According to them, financial performance refers to the ability of a company to control its financial resources in order to achieve its set objectives and is influenced by a combination of internal and external factors.

Return on Assets

Return on assets (ROA) is an important financial performance metric used to measure the capacity and capability of a company to generate or make profits using the totality of its owned assets. The ROA which is the widely used accounting-based measure of corporate performance in literature shows the amount of earnings that have been generated from invested capital. It is an indication of the number of kobo earned on each naira worth of assets (Nwala et al., 2020).

In their view, Akani and Swenem (2019) described ROA as a financial performance indicator that measures a company's profitability in relation to its total assets. They opined that ROA is an important profitability ratio which is most often highlighted in the analysis of financial statements due to its ability to indicate how successful a company is in creating profits. According to them, a higher ROA can be regarded as a positive sign for investors to invest their stock in a company. This is similar to the opinion of Parhusip et al. (2016) that ROA indicates the ability of a company to use its financial resources to generate value for shareholders. They also affirmed that the greater the ROA of a company the better the company's financial performance, hence, a high ROA attracts investors.

Nyanyuki et al. (2022) assessed the effect of capital adequacy on the financial performance of commercial banks in Kenya. The study was anchored on capital buffer theory and adopted correlational resign design. The target population comprised of 43 listed commercial banks, out of which a sample of 10 commercial banks were selected using purposive sampling technique. The study used financial statements from which secondary data was extracted from Nairobi security exchange for a period of 5 years from 2015 -2019.

The study established that capital adequacy determinant was negatively associated with financial performance of commercial banks in Kenya and it has significant effect. The study concluded that capital adequacy had a positive and significant effect on financial performance

of commercial Banks in Kenya. It is based on the findings that the study recommended that banks can increase their regulatory capital ratios by either increasing their levels of regulatory capital (the numerator of the capital ratio) or by decreasing their levels of risk-weighted assets (the denominator of the capital ratio) and capital reserves all the time for better financial performance.

In a similar study, Spaseska et al. (2022) examined the impact of capital adequacy ratio on the profitability of banks in North Macedonia. The empirical study utilized the Auto-Regressive Distributed Lag (ARDL) method for time series analysis using E-Views version 10. The results of the study revealed that there is a positive, but statistically insignificant relationship between capital adequacy ratio (CAR) and return on average assets (ROAA) of the Macedonian banks, both in the short and long-run. Also, results revealed that the impact of deposit to asset ratio (DAR) on ROAA is both positive and statistically significant in both the short and long run.

Gunawardhane et al. (2022) examined the impact of company-specific and macro-economic factors on the financial and market performance of insurance companies in Sri Lanka. The sample of the study consisted of nine listed insurance companies from 2010 to 2019, while panel regression was used for the analysis. Capital structure, capital adequacy, liquidity position, and company size were considered as company-specific factors, whereas inflation and GDP growth were considered as market-specific factors. Also, while net profit margin (NPM), return on assets (ROA), return on equity (ROE) and earnings per share (EPS) served as measures of financial performance, market value-added (MVA) was used to measure market performance. The findings of the study showed that capital adequacy and capital structure have a significant negative relationship with financial performance, while size is positively related to financial and market performance.

It was also revealed that the GDP growth rate is negatively associated with financial performance. Furthermore, the liquidity position of the company is positively related to the MVA. The study provided evidence that capital adequacy affects the financial and market performance of insurance companies in Sri Lanka and recommended that insurance companies should pay serious attention to these factors in order to enhance their financial and market performance.

Another study conducted by Bhattarai (2021) evaluated the effect of capital adequacy ratio on the financial performance of commercial banks in Nepal. The study employed descriptive and causal comparative research design and was based on secondary sources of data collected from

annual audit report of twenty-six commercial banks out of twenty-seven from 2012/13 to 2018/19. The remaining commercial bank called Rastriya Banijya Bank was excluded from the study due to unavailability of annual audit report. The study used mean range, standard deviation, coefficient of variation, correlation analysis, and regression analysis statistical tools to analyze a total of 182 observations. The findings revealed that supplementary capital is highly spread in comparison to core capital ratio and that there is a low degree of positive relationship of return on assets with core capital ratio and supplementary capital ratio. Results further revealed that there is low degree of positive relationship of return on equity and supplementary capital and low degree of inverse relationship between return on equity and core capital.

Mbaeri et al (2021) sought to examine the effect of capital adequacy ratio on the financial performance of listed commercial banks in Nigeria proxied by return on capital employed from 2014-2019. The data for the study was collected from the annual financial reports of the sampled commercial banks for the period covered and were analysed using panel regression. The study found that capital adequacy ratio had significant and positive effect on return on capital employed of listed commercial banks in Nigeria. The study, based on the findings, advised the Central Bank of Nigeria to increase the capital adequacy ratio of commercial banks by way of regulation and ensure that they are fully complied with by all and sundry.

Odongo (2021) conducted a similar study aimed at establishing the effect of capital adequacy on the financial performance of general insurance companies in Kenya. The study used a longitudinal research design for a period of 3 years from 2017 to 2019. Using a Panel data with a regression model, the study found that the largely positive position of the general insurance companies is an indication that capital adequacy requirements have a positive influence on the performance of the general insurance companies.

In conclusion, the study observed that capital adequacy ratio has a positive influence on the financial performance of the general insurance companies of Kenya. The study recommended that general insurance firms should have adequate assets and more specifically, high quality assets that translate into good performance by the firms.

Dialectic Regulatory Theory

The dialectic regulatory theory was propounded by Edward J. Kane in 1981. According to Kane (1981), a dialectical process is one in which outcomes are controlled over time by two forces that are constantly in direct opposition to each other. The theory postulates that there is a

raging war between the regulators and financial institutions. According to this theory, as regulators roll out policies that seem to serve as obstacles to profit maximization on the paths of financial institutions, the financial institutions will react by manipulating the system in order to avoid such reforms. Hence, the theory explains how regulated financial institutions such as banks and insurance companies use clever and surreptitious ways to avoid some regulations designed to restrict their behaviour on the ground that such regulations would adversely affect their performance.

Gummi (2018) posited that the dialectic regulatory theory centered on the work of Kane (1981) was propounded with a view to elucidating the relationship between financial institutions and their regulators. In his opinion, Magnus (2017) asserted that the dialectic regulatory theory presumes that regulated firms consciously resist efforts by regulators to impose restraints on their profit-making activities. He opined that as regulators respond to regulatory concerns by introducing new regulation, regulatory dialectic is bound to occur as the regulated firms will try to find ways around it.

The regulatory dialectic theory is relevant to this study as it highlights the tendency of some insurance firms capitalizing on loopholes in regulatory systems put in place by the National Insurance Commission (NAICOM) particularly with respect to capital adequacy, to circumvent regulations they consider as unfavourable with respect to their wealth maximization and profit-maximization objectives.

3.0 Methodology

The study adopted ex-post facto research design because secondary data were collected from the published annual financial reports and fact books of the insurance firms. The population of this study comprised all the 24 insurance companies listed on the Nigerian Exchange (NGX) from year 2013 to 2022. This study used purposive sampling technique based on two criteria. Firstly, selected insurance firms must have been listed on the Nigerian Exchange (NGX) throughout the period under consideration that is, from 1st January, 2013 to 31st December, 2022. Secondly, selected insurance companies must have complete data set for the periods of 2013-2022. Based on these criteria, 15 insurance companies were purposively sampled and examined for this study. The study collected data from the annual financial reports and fact books of the 15 selected insurance firms covering the period 2013 – 2022. The data comprised of return on assets (ROA) as proxy for financial performance, while tier 1 capital ratio and tier 2 capital ratio served as proxies for capital adequacy of the sampled listed insurance firms.

Also, due to the nature of the data which was collected over a period of time from year 2013 – 2022 (10 years) for 15 insurance companies, panel regression analysis was considered most suitable and appropriate technique of data analysis in this study. The study therefore, adopted the following panel regression model:

$ROA_{it} = \beta o + \beta_1 TR1_{it} + \beta_1 TR2_{it} + \varepsilon_{it}$

Where:

i = Number of firms in the industry, that is fifteen (15) insurance companies

t= Period covered, that is ten (10) years

ROA (Measure of Financial Performance) = Return on Assets (Dependent Variable)

βo = Constant parameter

TR1= Tier 1 Capital or Core Capital

TR2= Tier 2 Capital or Supplementary Capital

β_1 is the regression coefficient of the independent variable

ε = Probable error term

Table 1: Variables of the Study and their Measurements

Variables	Measurement	Supporting Studies
ROA	$\frac{\text{Profit after Tax}}{\text{Total Assets}}$	Otekunrin, et al. (2019); Bhattarai, D. J. (2021)
Tier 1 Capital	$\frac{\text{Tier 1 Capital}}{\text{Risk Weighted Assets}}$	Nabeel & Hussain (2017); Odongo, D. (2021)
Tier 2 Capital	$\frac{\text{Tier 2 Capital}}{\text{Risk Weighted Assets}}$	Nabeel & Hussain (2017); Muturi & Njeru (2019)

4. 0 Results and Discussions

Data Presentation

Fisher-Type Unit Root Test

Fisher-type unit root test is a common statistical test used to determine if a given panel contains unit root. It is one of the most commonly used statistical tests when it comes to analyzing the stationary of a panel data. It has a null hypothesis that says there is a unit root present, if the P-value is less than 0.05 you will reject the null hypothesis "there is a unit root in the panel data".

Table 2: Fisher-Type Unit Root Test

Variables	**Lag Diff**	**P-value**	**Remark**
ROA	Lag 1 Drift	0.0000	No Unit root, P<0.05 at 1%
Tier 1 Capital	Lag 1 Drift	0.0000	No Unit root, P<0.05 at 1%
Tier 2 Capital	Lag 1 Drift	0.0000	No Unit root, P<0.05 at 1%

Source: E-views 10 Computation, 2023

As indicated in table 2 the unit root test shows that the panel data series contains no unit root (this entails that the data set is stationary) at the first (1) lag difference. The analysis shows that p-value of all the variables are 0.000 which is significant at 0.001 level of significance. So therefore, the null hypothesis "There is unit root" will be rejected.

Normality Test

Table 3: Skewness and Kurtosis statistics

	ROA	TIER 1	TIER 2
Skewness	-1.262420	-0.870839	-0.948240
Kurtosis	7.784892	3.695029	4.298107
Jarque-Bera	273.1867	32.82073	49.29601
Probability	0.000000	0.000000	0.000000

Source: E-views 10 Computation, 2023

The result of the normality test in table 3 shows that return on asset (ROA), core capital and tier 2 capital are all negatively skewed to the left. However, the Kurtosis analysis indicates that the variables (return on asset, tier 1 capital and tier 2 capital) are Leptokurtic, which means that the kurtosis is greater than 3.0.

Descriptive Statistics of Variables

Table 4 provides summary of statistics for the dependent and independent variables of the study in order to appreciate the nature of the results.

Table 4: Descriptive Statistics

Variables	Mean	Std Deviation	Minimum	Maximum
ROA	-3.291976	1.493173	-9.740914	0.246611
TIER 1	2.160383	0.899652	0.000000	4.402517
TIER 2	1.982817	0.808845	0.000000	4.485961

Source: E-views 10 Computation, 2023

The average return on asset (ROA) of the listed insurance companies in Nigeria, according to Table 4, is -3.3%, which indicates that the companies are not maximizing profits as they should. This finding may be due to the impact of governmental, monetary, and fiscal policies and regulations on the insurance companies. The lowest and maximum return on assets (ROA) for insurance companies are -9.7% and 0.2%, respectively, while the ROA deviation is 1.5 percent. This suggests that the maximum return on assets for the insurance sector is 0.2% while the most net loss it has seen during the past 10 years is -9.7%. Additionally, as shown in table 4, the industry's average tier 1 capital or core capital for the 10 years under study was 2.2%, with a 0.90% deviation from the mean. While the maximum and minimum tier 1 capital is 4.4 and 0.0 respectively. However, the tier 2 capital average is 1.98 with a 0.81% standard deviation from the mean, the maximum and minimum tier 2 capital is 4.49 and 0.00.

Correlation Result

The Correlation Matrix table shows the relationship between all the pairs of variables in the Regression Model. It suggests how the independent variables relate with the dependent variable and how the independent variables relate among themselves.

Table 5: Correlation Matrix of variables

	ROA	**TIER 1**	**TIER 2**
ROA	1	0.118525	0.061279

TIER 1	0.118525	1	0.859022
TIER 2	0.061279	0.859022	1

Source: E-views 10 Computation, 2023

The correlation matrix as per table 5 showed the relationship between the pair of explanatory variables used in the regression model. All the variables are perfectly correlated with itself. Return on asset (ROA) has a positive relationship with core capital (0.118525) and tier 2 capital (0.061279) of the listed insurance firms, this implies that an increase core capital and tier 2 capital will increase the return on asset of the listed insurance firms in Nigeria. Also, tier 1 capital has a positive association with tier 2 capital, the implication is that an increase in tier 1 capital will result to an increase in tier 2 capital.

Regression Analysis

Breusch-Pagan Test

The Breusch-Pagan test would be used to determine if a Pooled Ordinary Least Squares (POLS) regression would be used to test the hypotheses or if Random effect model (REM) or Fixed effect model (FEM) would be used.

The Breusch-Pagan test has a null hypothesis "POLS is appropriate than FEM/REM" OR "No effect (of different cross sections on intercept)"

If P-value is greater than 0.05 then accept null hypothesis and go for POLS.

If P-value is less than 0.05 then reject the null hypothesis and go for REM/FEM.

Table 6: Breusch Pagan test

Lagrange multiplier (LM) test for panel data

Probability in ()

Null (no rand. effect)	**Cross-section**	**Period**	**Both**
Alternative	One-sided	One-sided	
Breusch-Pagan	121.6988	4.268776	125.9676
	(0.0000)	(0.0388)	(0.0000)

Source: E-views 10 Computation, 2023

The Breusch-Pagan test in table 6 shows that the p-value for" cross section, period and both" are all significant (P<0.05), so therefore, the null hypothesis "POLS is appropriate than

FEM/REM" will be rejected and the alternative hypothesis "FEM/REM is appropriate than POLS" will be accepted.

Hausman Test

The Breusch-Pagan test determined that FEM/REM is more appropriate than POLS, the Hausman test would be used to determine if fixed effect model (FEM) or random effect model is appropriate to test the hypothesis. The Hausman test has a null hypothesis "REM is appropriate then FEM"

If P-value is greater than 0.05 then accept null hypothesis

If P-value is less than 0.05 then reject null hypothesis and proceed to FEM

Table 7 Hausman Test

Correlated Random Effects - Hausman Test
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.047920	2	0.5922

Source: E-views 10 Computation, 2023

According to table 7 the Hausman test reveals a P-value (0.5922) which is greater than 0.05. Therefore, the null hypothesis "REM is appropriate than FEM" will be accepted and the alternative hypothesis "FEM is more appropriate than REM" will be rejected.

Table 8: Random Effect Model

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.013800	0.425885	-9.424601	0.0000
TIER 1	0.548231	0.205697	2.665240	0.0083
TIER 2	-0.233287	0.227019	-1.027613	0.3053
R-squared	0.36479	Mean dependent var		-1.151988

Adjusted R-squared	0.27760	S.D. dependent var	1.257700
F-st atistic	4.183575	Durbin-Watson stat	0.896694
Prob (F-statistic)	0.016468		

Source: E-views 10 Computation, 2023

The results of the Random effect model (REM) in table 8 shows that the coefficient of determination "Adjusted R-Square" is 0.278 indicating that the variables considered in the model accounts for about 27.8% variation in the dependent variable that is return on asset (ROA), while the remaining 72.2 unaccounted variation is as a result of other variables not addressed by this model. It denotes that 28% of total variation in the return of asset (ROA) of Nigerian listed insurance firms is caused by capital adequacy regulations (tier 1 and tier 2 capital). P-value of 0.001 indicates that the model is fit and the explanatory variable are properly selected, combined and used. This is confirmed by the value of F- statistics of 4.18. Hence, the findings of the study can be relied upon.

Test of Hypotheses

H_{01}: Tier 1 capital has no significant effect on the ROA of insurance firms in Nigeria.

The random effect model as presented in table 8 indicates that there is a positive (0.548231) and significant (0.0083) relationship between ROA and tier 1 or core capital of the listed insurance firms in Nigeria. Therefore, the null hypothesis that tier 1 capital has no significant effect on the ROA of listed insurance firms in Nigeria is rejected while the alternative hypothesis that tier 1 capital has significant positive effect on the ROA of listed insurance firms in Nigeria is accepted. This implies that capital adequacy regulation on increase in tier 1 capital will also increase the financial performance of listed insurance firms in Nigeria.

H_{02}: Tier 2 Capital has no significant effect on the ROA of insurance firms in Nigeria.

The t value of -1.027 and p value of 0.3053 as shown in table 8, indicates that there is a statistically insignificant negative relationship between tier 2 capital and return on asset (ROA) of the listed insurance firms in Nigeria. This gives the basis for accepting the null hypothesis "Tier 2 Capital has no significant effect on the ROA of listed insurance firms in Nigeria.

Therefore, the empirical evidence obtained from the Panel Random effect regression model shows that the relationship between return on assets (ROA) and tier 1 capital is positive and significant at 1%. This is justified by a positive 't' value of 2.66 and p>|t| 0.000. Also, the

positive coefficient of 0.548231 indicates that a one percent increase in tier 1 capital while other variables remains constant will result to an increase in the firms' ROA by 0.5%. This implies that, core capital has a positive association and significant effect on the return on asset of listed insurance firms in Nigeria. This result aligns with the findings of Bhattarai (2021) who evaluated the effect of capital adequacy ratio on the financial performance of commercial banks in Nepal.

However, **t**he result of the random effect model suggests that tier 2 capital has a negative and insignificant effect on the return on assets (ROA) of listed insurance firms in Nigeria this is evidenced by a negative coefficient (-0.233287) and an insignificant p-value (0.3053). The implication of this is that any percentage increase in tier 2 capital will result to a negative impact on the profitability of the listed insurance firms in Nigeria. The finding of this study is consistent with the findings of Francis and Osborne (2021), who used the Hancock and Wilcox approach together with individual capital requirements applied to banks in the UK for the period 1996 to 2007. They found a positive association between capital ratios and bank-specific capital requirements, consistent with the idea that banks' desired capital ratios increase as discretionary add-ons increase. They also documented evidence that banks, when adjusting towards higher desired capital ratios, undertake a combination of strategies by reducing assets, including loans, decreasing risk-weighted assets and increasing total regulatory capital, though much of this adjustment is in the form of lower-quality tier 2 capital instruments. They noted that banks' focus on adjusting through tier 2 could potentially hinder the benefits of capital regulation if such tier 2 capital instruments are less capable of absorbing losses during more trying conditions.

5.0 Conclusion and Recommendation

The study submits that capital adequacy regulation enhances the financial performance of insurance firms because it ensures that insurance companies have the minimum capital requirements to offset potential losses and stand strong in the face of any economic crisis. The study concludes that capital adequacy regulation with respect to tier 1 or core capital should be prioritized by insurance regulatory authorities since tier 1 capital has a significant positive effect on financial performance of insurance companies in Nigeria. However, tier 2 capital

suggests a negative and insignificant impact on the return on asset of listed insurance firms in Nigeria and should not be given priority by the insurance regulatory authorities.

The study recommends that the National Insurance Commission (NAICOM) which is Nigeria's insurance regulatory authority, should ensure that insurance firms adhere strictly to capital adequacy regulations by maintaining adequate capital to support their risk profiles. It is also recommended that insurance firms should develop strategies to raise their capital levels to adequate levels prescribed by the regulatory authority in order to lower insolvency risk and boost the confidence of policyholders. In this regard insurance firms can raise more capital from shareholders and plough back realized profits in order to meet the Regulator's adequate capital requirements.

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