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Leveraging firm-specific characteristics on the profitability of quoted non-life insurers in Nigeria

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Abstract

Profitability of insurance companies is sensitive either positively or negatively to various internal and external factors requiring delicate balancing between focusing on either underwriting or investment practices. Findings on profitability trends are therefore inconsistent across different jurisdictions. This has overtime been studied across geopolitical spaces showing varied outcomes due to employment of different methods and focus on firm specifics. It becomes even more crucial in Nigeria whose insurance penetration is very low to understand the drivers of profitability. This study aimed at assessing how firm-specific characteristics influence profitability in the non-life sector in Nigeria. A panel research design was run on 15 quoted non-life insurance companies for 15 year for the period 2008 -2022. Census techniques were employed adjusted by data availability. Reasonable evidences were found to support that FS negatively significant while FL and LIQ were positively significant to profitability at $p<0.05$. FL stands out at huge coefficient of 67.57% throwing light on adequate provisions for reserves which may have been ploughed into investment to produce profitability. This emphasizes that sound reserving strategy and liquidity management is sine qua non to the fortunes of non-life insurance sector in Nigeria. Regulators should consider risk-based supervision to monitor liquidity, reserving, premium growth rate and claims management in view of their insignificant outcomes of the proxies (loss ratio, retention rate and premium growth rate).

Keywords
Financial leverage, firm size, liquidity, loss ratio, profitability, retention rate

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1. Introduction

Insurance companies worldwide are having difficulties achieving sustainable profits due to increased competition, market forces and firm's management of specific characteristics (Fareed, Ali, Shahzad, Nazir & Ullah, 2016). Profitability of insurance companies is quite sensitive either positively or negatively to various internal and external factors requiring delicate balancing between either focusing on underwriting, or investment practices. Findings on profitability trends are therefore inconsistent across different jurisdictions. Azmil, Irawan and Sasonkgko (2020) posits that from 2013 to 2017, profits of Indonesia's general insurance experienced declines despite increased underwriting and investment returns, a pointer to mixed characteristics.

On a similar plane, the Nigeria's insurance industry had experienced profit fluctuations overtime and sadly this has been attributed to its less than one percent penetration of the economy in decades (Orimisan, 2021). As it stands, the industry faces a number of challenges, ranging from poor strategies in underwriting, low patronage and negative public perception among others. Also, inflation in the country has increased claims responsibilities, while premium growth has failed to match claims growth indicative of unsound underwriting strategy with inappropriate pricing (Egwuatu, 2021; Matakiani, 2021). National insurance commission (NAICOM), (2024) reported loss ratio growth rate of 22.9% in 2022, 32.1% (2023), and 55% (2024) which negates the insurance accounting theory that continuous reduction in loss ratio improves rating and profitability.

In the same line, a glance at one of the company's reports shows the fluctuations in profitability with Return on Assets (ROA) in 2008 at 8.3%, 2013 (-2.2%) and 2022 (1.6%). However, attention seems to focus more to recapitalize or restructure insurance businesses rather than strengthen market conduct, managerial efficiency and rating indices (Okparaka & Uduak, 2022). Various factors were identified to be hindrances to financial performance like product pricing, risk selection, claims management and marketing and administrative expenses, investment earning, dividend yields, poor product development strategy, ill-defined distribution channels, low public confidence, tax and asset management of insurance companies (Wright 1992; Swiss 2008; Makatiani, 2021, Msomi, 2023).

In spite of the several factors being flagged, the intensity or significance of these variables are left for guesses particularly in the Nigerian context in view of the methodology and scope of research. In essence, if what determines profitability of insurance operations management can be ascertained, shareholders' wealth maximization will be promoted raising policyholders' confidence which will cascade to higher insurance companies' penetration in the continent and the world around (Msomi, 2023). Several authors studied and unveiled different variables affecting profitability of non-life in several countries without convergence (Lire & Tegegn (2016), Guendouz & Ouassaf (2018), Chideh & Sorayaei (2019), Tegegn, Sera & Merra (2020), Azmil, Irawan & Sasonkgko (2020), Amsaveni & Selvan, (2020), Hamal, (2020), Ambaw & Lijuan, (2021), Siddik, Hosen, Miah, Kabiraj, Joghee & Ramakrishnan (2022) & Msomi, (2023). Also, in Nigeria various authors such as Owolabi, Oloyede, Iriyemi and Akinola (2017), Olarewaju, Oladejo, Olaoye, Olarenwaju and Ogunmakin (2018), Abass, Dansu and Oyetayo (2021), Olaiya, Arikewuyo, Shogunro, and Yunusa (2021); and Okparaka & Uduak, (2022), has examined these internal factors' effect on profitability with their outcomes inconsistent.

The attention of our study attempts to be specific on crucial internal factors based on inconsistencies across differing economic zones, A deductive theoretical underpinnings of insurance accounting theory guided our research questioning of how these eight factors govern profitability outcomes on non- life insurance business. Subsequently, we propose that loss ratio, retention rate, premium growth rate, expense ratio, age, firm size, leverage, and liquidity will not significantly influence profitability of non-life insurers in Nigeria.

2. Literature Review

Conceptual Review

This section contextualizes the various variables examined in the literature

Firm- Specific Determinants

Firm's specific factors are internal factors of businesses which are under their control. They include size, age, loss ratio, retention rate, leverage, liquidity, expense ratio and premium growth rate (Lire & Tegegn, 2016). Age represents the number of years companies had been in operation in the industry which culminate to experiences and reputation that should reduce cost in the long run (Kaya, 2015). Therefore, older companies have higher chances to improve profit than younger ones (Hamal, 2020). Leverage means amount of debt finance used by firms to fund its continuity (Ambaw & Lijuan, 2021); therefore, a higher level of debt can negatively affect insurance companies' profitability if not effectively managed (Hamal, 2020). For insurance companies, leverage comes from unearned premiums, expired policies, and any claims not yet paid (Lee, 2014). Size refers to how big or small a firm is in terms of net assets; when faced with adverse market fluctuations and catastrophic events, large insurance companies are usually better able to handle them than small ones; they are better able to recruit employees with professional skills than small firms, and they are able to achieve economies of scale, which are the major factors in delivering profit (Ambaw & Lijuan, 2021).

Liquidity refers to an organization's ability to fulfill its obligations in a short term without loss of value (Turney & Robbins, 2015); from the insurer's perspective, liquidity is the ability to meet liabilities, particularly claims payments. It is also crucial to solvency in insurance management (Chen & Wong, 2004) which can reverse profitability. Liquidity management is intricately linked to profitability in insurance management efficiency. Too much liquidity can reduce profitability but improve claims management while low liquidity can result in improved profitability. In this instance liquidity is expected to be negative to profitability.

Premium is determined by the product of the insurance rate and exposure per unit (Abate, 2012); the premium growth rate measures the level of market growth in sales and this measure is also used for early warning signals of financial impairment. The underwriting risk or loss ratio represents the insurers' underwriting quality and strategy (Mwangi & Murigu, 2015); Insurers can monitor and report low operating costs if they recognize the proximate reason for underwriting risk (Lee & Lee, 2012). Retention rate or risk capacity is the amount of risk an insurance company is able and willing to accept on its portfolio. It measures the risk-taking propensity or risk appetite in determining reinsurance utilization in managing insurance risk (Ambaw & Lijuan, 2021). Expense ratio indicates an insurance company managerial efficiency of its expenses before its claims and investment costs and it is a good measure of profitability (Sebastian, 2023). It is the ratio derived by dividing operating expenses (such as costs of acquiring, underwriting and other transaction-related costs) by the net premium earned. Therefore, there must be proper accounting of expenses to avoid adverse selection of risk (Pjanic, Mitrasevic & Lukovic, 2022; Sebastian, 2023).

Profitability

A company's financial strength dictates its profitability and facilitates the fulfillment of long-term obligations (Tegegn, Sera & Merra, 2020); increase insurance penetration and be socially responsible (Burca & Batrinca, 2014; Azmi et al., 2020; Olaiya et al., 2021; Siddik et al., 2022); profitability can be measured using financial ratios such as return on asset, equity, investment, as well as break even analysis (Brigham & Ehrhardt, 2017). This study focuses on ROA as used in extant literature. According to Malik (2011), ROA is a more accurate measure of profitability compared to other ratios. Among the assets are cash in the bank, accounts receivable, property, equipment, inventory, and furniture. Insurers' efficiency and financial performance are the two most important ratios to compare because they show the income they produce from their assets.

Theoretical Review

Risk bearing theory of profit relates to this study and is associated with Hawley F.B since 1883 who views risk taking as a key role of an entrepreneur. The theory assumes that profit is an income an entrepreneur earns for taking risks because the task is bothersome. Therefore, profit is the excess of fund above the actuarial value of the risk. Avoidance of risk can also result to profit, while size of risk and profit does not usually correlate (Jhingan, 2009)

This study is also anchoring on the theory of the firm. It is a fundamental concept in economics which explains the existence, structure and behavior of firms in relation to profit. The theory has been elevated

by various authors (Penrose, 1959, Cyert & March 1963, Alchain & Demsetz, 1972 and Foss, 1997). The theory assumes that firms maximize profit by optimizing production and minimizing costs by taking cognizance of cognitive routines, organizational culture, healthy agent and principal relationship, and identifying firm's unique capabilities to create competitive advantage for the organization. Furthermore, it explains the cognitive behavior of the firm on how it focuses more on efficiency of its operations by using its resources to create valuable, rare and hard to imitate products to achieve competitive advantage and reduce agency costs, and in addition insurance companies are expected to reduce moral hazard and information asymmetry. The theory is relevant to understanding of how insurance firm mechanizes efficiency of its operations, whereby loss ratios as well as expense ratio can be reduced, economies of scale can be achieved to increase firms' size, premiums will increase through concerted sales activities, more investment can be ventured into to cover for claims cost and more policies can be retained to boost profitability (Hasibuan, Sadalia & Muda, 2020).

Empirical Review

Ayele (2012) in his study identified liquidity, volume of capital and growth leverage as determinants of insurance profitability with an influence in Ethiopia and found that tangibility and age have no impact on insurance profitability. The research was conducted for nine years period.

Batool and Sahi (2019) examined financial performance of insurance companies in USA and UK during global financial crisis, 2007 – 2016 using panel data techniques on 24 insurance companies. The explanatory variables are size of firm, liquidity, leverage and asset turnover while external variables are gross domestic product (GDP), cost per impression (CPI), interest rate and West Texas intermediate (WTI). Dependent variables for profitability are ROA and ROE. The study finds that size of firm, liquidity, leverage, asset turnover, GDP and WTI have positive significance in USA while CPI and interest rate have negative significance impact. Size of firm, liquidity, GDP, CPI and WTI have positive effect but leverage, asset turnover and interest rate have negative significant impact in UK.

In a similar vein, Cekrezi (2015) examined the leading factors of financial performance in five insurance companies in Albania in the period of 2008 to 2013. The results showed leverage and risk (standard deviation of sales to average value of sales) negatively impact financial performance (ROA), while tangibility (fixed assets to total assets) positively impacts it.

Shiu's (2004) studied UK's 1,922 non-life insurance companies, 1986–1999. The research confirmed that liquidity, unexpected inflation, interest rate and underwriting profits have significant impact on the performance of these companies. The study employed 3 measures of financial performance such as investment yield, percentage change in shareholders' fund and return on equity.

Zhoa, Pei, and Pan (2021), conducted research on the "Evolution and determinants of Chinese property insurance companies' profitability" for the period 2013-2017 and explored the factors that influence profitability due to technical efficiency, although mixtures of inputs and outputs adversely influenced the failure of some companies showing importance of allocative efficiency on insurer's profitability.

According to Deyganto and Alemu (2019) underwriting, premium growth, solvency ratio, GDP growth, and inflation rate affected performance of insurance companies in Hawassa, Ethiopia.

Zinyoro and Aziakpono (2024) carried out a systematic literature review on performance determinants of non-life insurance firms in South Africa. The research evaluated 235 studies published from 1990 to 2021. The review confirms that firm level factors such as size, organizational form, diversification, capital structure, reinsurance, corporate governance, distribution system and group affiliation as well as external factors such as market structure, macroeconomic, financial and institutional development are the major determinants of non-life insurer's performance.

Siddik, Hosen, Miah, Kabiraj, Joghee and Ramakrishnan, (2022) employed data from 2011 to 2019 for 16 non-life insurance companies operating in Bangladesh, the research examined the effects of insurers' financial insolvency on the profitability of insurance companies. Return on assets (ROA), and return on equity (ROE) were used as proxies for profitability. Fixed-effect regression outcome shows that insurers' financial insolvency has significant adverse effect on non-life insurance companies' profitability while

financial leverage, technical provision, age and inflation have a noteworthy adverse influence on profitability.

Based on selected Saudi insurance companies listed on the Saudi Stock Exchange (Tadawul), Alsallawi (2018) investigated the effect of institutional variables like leverage, capital market assets, and firm size on profitability. The study was based on institutional theory. Multiple regression analysis was used on the data obtained. it was confirmed that institutional factors have significant relationship with Saudi insurance companies' return on assets, which boosts their profitability.

In Nigeria, Abass, Dansu and Oyetayo (2021) examined the technical characteristics of insurance operations and financial performance of non-life insurance companies in Nigeria. The result revealed that reserves, shareholders' fund, firm size, capital adequacy and premium growth are the technical characteristics that significantly influence the financial performance.

Olarenwaju, Oladejo, Olaoye, Olarenwaju and Ogunmakin (2018) investigated firm-specific factors as determinants of profitability using 8 composite insurance company in Nigeria from 2009 to 2015. The results revealed that while a negative linear relationship exists among return on asset, leverage, tangibility, and size, there also exist a positive linear relation between return on asset and growth of the composite insurance company in Nigeria.

3. Research Methods

The study adopted panel research design and short panel least square technique by gathering data from 15 quoted non-life insurance companies out of 24 listed on the Nigerian Exchange for 15 years. Based on their aggregate, 75% of the sector market capitalization were employed due to availability of data for the period under investigation. Data was obtained from financial statements of the companies and the Nigerian Insurers Digest 2008-2022. 2008 was selected as the start-off year because the insurance industry far-reaching reform on recapitalization 2005 was concluded in 2007. More so the Insurance Act 2003 is the prevailing insurance law.

Measurement of Variables

The variables of the study will be measured using the following metrics:

Table 1. *Measurement of variables*

Variables	Indicators	Definitions	Expected sign	Source
Independent Variables	Firm's size	Ln (Total Assets)	+/-	Lire & Tegegn, 2016, Abass, Dansu & Oyetayo 2021, Hamal, 2020, Isayas, 2021, Morara and Sibindi ,2021
	Financial leverage	Total liabilities / Total equity	+/-	Azmi, Irawan & Sasongko, 2020, Okparaka & Uduak, 2022, Isayas, 2021
	Premium growth rate	GPW(New) - GPW (old) / GPW (old)	+/-	Lire & Tegegn, 2016, Tegegn, Sera & Merra ,2020, Abass, Dansu & Oyetayo 2021, Azmi, Irawan & Sasongko, 2020, Olarenwaju, Oladejo, Olaoye, Olarenwaju and Ogunmakin (2018), Kaya, 2015
	Age of company	Number of years of Company's operation	+/-	Isayas, 2021, Kaya, 2015, Siddik, et al., 2022
	Retention rate	Net premium income / Gross premium written	+/-	Guendouz & Ouassaf, 2018, Wongsumatt, Thaothampitak, Kongjam, Ruttanapibool & Apacuppakul & Koedkaeo, 2021).
	Loss ratio	Net claim or claims paid / Net premium income	+/-	Guendouz & Ouassaf, 2018, Abass, Dansu & Oyetayo 2021, Azmi, Irawan & Sasongko, 2020, Olarenwaju, Oladejo, Olaoye, Olarenwaju and Ogunmakin (2018), Kaya, 2015
	Liquidity ratio	Total current asset / Total liability	+/-	Tegegn, Sera & Merra ,2020, Azmi, Irawan & Sasongko, 2020, Hamal, 2020, Isayas, 2021
	Expense ratio	Operating expenses / Net premium earned	+/-	Pjanic, Mitrasevic & Lukovic, 2022
Dependent Variable	Profitability (Return on Asset)	Net profit after tax / Total asset	+/-	Abass, Dansu & Oyetayo 2021, Wongsumatt, Thaothampitak, Kongjam, Ruttanapibool & Apacuppakul & Koedkaeo, 2021, Morara and Sibindi, 2021

Note. Researcher computation, 2024

Model Specification

The functional form of the model is specified below:

$$Profitability\ (ROA)_{it} = f(FSF_{it},) \quad (1)$$

Where *ROA*= Return on Assets, *FS* = Firm Size, *PGR* = Premium Growth Rate, *AC* = Age of Company, *RR* = Retention Rate, *LR* = Loss Ratio, EXR = Expense Ratio, FL = Financial Leverage, and LIQ = Liquidity. Therefore, the panel data regression model is expressed below:

$$ROA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 FL_{it} + \beta_3 PGR_{it} + \beta_4 AC_{it} + \beta_5 RR_{it} + \beta_6 LR_{it} + \beta_7 LIQ_{it} + \beta_8 EXR_{it} + \mu_{it} \quad (2)$$

t = time series, subscript i = 1, 2, …, 15 (individual firms), μ = error term

Where Firm's Size (FS), Financial Leverage (FL), Premium growth rate (PGR), Age of company (AC), Retention rate (RR), Loss ratio (LR), Liquidity ratio (LIQ), Expense ratio (EXR), ROA = Return on Assets, β_0 = intercept coefficient, β_t = Partial slope coefficient of *FSF* with respect to *ROA,*

The expected signs of the coefficients (a priori expectation) if insurance operations management is efficient will be:

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$ while $\beta_6, \beta_7, \beta_8 < 0$

4. Analysis and Results

The first section explains descriptive statistics for the examined variables then robustness test for ROE, correlation analysis and the Ordinary Least Squares (OLS) results.

Descriptive Outputs

This section gives interpretation to the descriptive statistics results employed on the secondary data obtained from annual reports of the non-life insurers in Nigeria such as mean, median, maximum, minimum, standard deviation, skewness and kurtosis. Table 2 outlines the descriptive statistics of variables.

Table 2. *Descriptive Statistics*

Variables	Obs.	Mean	Median	SD.	Min.	Max.	Skewness	Kurtosis
ROA	188	0.789	0.796	0.061	0.630	0.900	-0.399	2.419
FS	225	17.314	16.674	1.907	15.955	22.385	2.005	5.684
FL	225	0.976	0.969	0.050	0.882	1.133	0.598	2.973
PGR	225	0.005	0.008	0.059	-0.320	0.244	-2.452	18.80
AC	225	3.514	3.555	0.533	1.609	4.317	-0.655	3.270
RR	225	0.969	0.969	0.018	0.902	1.010	-0.809	4.210
LR	225	0.922	0.926	0.048	0.772	1.072	-0.713	4.542
LIQ	224	5.085	5.107	0.229	4.482	5.688	-0.115	2.784
ER	225	-0.397	-0.374	0.915	-2.796	2.118	0.036	3.088

Note. Researcher computation, 2024

After winzorizing, salient indicators reveal ROA, PGR, AC, RR, LIQ, and LR are left-skewed but not far away from zero, implying that these variables have high values. FS, FL and ER that are right-skewed, suggesting mainly low values most of the time; that is, firms are relatively young with average of 4 years, low on debt usage and well-managed expenses. The variances of all the variables are relatively low which signals normality and level managerial behavior. The kurtoses of the variables are not far from three (3) except PGR (18) indicating evenness and tracking normality. The skewness of the variables align with theoretical perspective of insurance accounting theory aside from the following; LR which is negative instead of being positive to boost profitability, LIQ, and PGR failed to follow expectation as they expected to be negatively skewed. The heavy-tailed or light-tailed nature of the data is quantified by the kurtosis. FS, PGR, and ER are heavy tailed meaning they are susceptible to shocks either way which may imply that they are not well managed. Of interest is LIQ which is left-skewed and moderate kurtosis suggesting high liquidity and suspect to poor investment strategy and focused on claims management, a delicate balancing required for profitability of insurance companies.

Pre-Estimation Test

The study carried out correlation statistics to establish the direction and strength of association, and subsequently went to adopt short panel least square regression to obtain the results. Thereon, inferences were discussed on the implications of the regression results

Table 3. *Correlation Matrix*

Variables	ROA	FS	FL	PGR	AC	RR	LR	LIQ	ER
ROA	1.000								
FS	-0.593***	1.000							
	(0.000)								
FL	0.279***	-0.030	1.000						
	(0.000)	(0.652)							
PGR	0.057	-0.098	-0.076	1.000					
	(0.435)	(0.142)	(0.257)						
AC	-0.060	-0.164**	-0.020	0.077	1.000				
	(0.411)	(0.014)	(0.760)	(0.250)					
RR	-0.254***	0.223***	-0.275***	-0.057	0.018	1.000			
	(0.000)	(0.001)	(0.000)	(0.391)	(0.783)				
LR	0.121*	0.180***	0.519***	-0.118*	-0.137**	-0.238***	1.000		
	(0.098)	(0.007)	(0.000)	(0.076)	(0.040)	(0.000)			
LIQ	0.445***	-0.586***	-0.365***	-0.101	-0.057	-0.053	-0.286***	1.000	
	(0.000)	(0.000)	(0.000)	(0.131)	(0.398)	(0.430)	(0.000)		
ER	0.182**	0.085	0.952***	-0.103	-0.072	-0.216***	0.525***	-0.409***	1.000
	(0.012)	(0.204)	(0.000)	(0.123)	(0.285)	(0.001)	(0.000)	(0.000)	

*** p<0.01, ** p<0.05, * p<0.1

Note. Researcher computation, 2024

On examining the correlation matrix, it is safe to establish that there is no multicollinearity among the explanatory variables, as the values are very low and far below 0.8. However, LR, LIQ and ER are expected to be negatively significant but were positive implying these variables may not boost profitability. FS, AC and RR are negative instead of positive while PGR is positive aligning with a-priori expectation but insignificant.

Hypothesis Testing

The Panel regression model using Ordinary Least Squares (OLS) was estimated to obtain the significant estimates. Meanwhile, the natural logs of the variables were used in the estimation process, thereby generating elasticity coefficients.

H_0: There is no significant impact of firm-specific factors on return on asset of quoted non-life insurance companies in Nigeria.

Table 4. *Baseline Regression Model (Dependent Variable: ROA)*

Variables	Pooled OLS	Fixed Effects	Random Effects
FS	-0.0108 (3.02)**	-0.0124 (2.72)**	-0.0112 (2.71)**
FL	0.8165 (2.46)*	0.5830 (2.22)*	0.6757 (2.52)**
PGR	0.1113 (1.29)	0.0396 (0.50)	0.0580 (0.72)
AC	-0.0109 (-0.86)	0.0208 (0.99)	-0.0059 (-0.44)
RR	0.0677 (0.18)	-0.0357 (-0.12)	-0.0452 (-0.14)
LR	0.187 (1.95)	0.0218 (0.21)	0.0809 (0.77)
LIQ	0.1096 (2.79)**	0.0632 (1.68)*	0.0829 (2.28)**
ER	-0.0230 (-1.27)	-0.0266 (-1.91)*	-0.0233 (-1.59)
Constant	-0.5892 (-0.80)	0.0440 (0.08)	-0.1199 (-0.32)
R^2 Within	–	0.324	0.308
R^2 Between	–	0.364	0.698
R^2 Overall	0.533	0.357	0.513
F-test FE vs Pooled	–	8.71***	–
Breusch-Pagan LM	–	–	$\chi^2 = 56.55$, $p < 0.001$
Hausman Test	–	–	$\chi^2 = 13.96$, $p = 0.083$

Note. Researcher computation, 2024; Standard errors are heteroskedasticity-robust and clustered at the firm level. Significance: p<0.1, *p<0.05, **p<0.01. t-statistics are reported for Pooled OLS and FE; z-statistics for Random Effects. R^2 Within, Between, and Overall are from panel models; pooled OLS reports only overall R^2.

Multicollinearity Diagnostics (Pooled OLS)

Individual VIFs: FL= 1.94, expense ratio = 1.15, liquidity ratio = 2.34, firm size = 2.28, loss ratio = 1.68, retention rate = 1.26, PGR = 1.11, firm age = 1.10 Mean VIF = 4.61. Given the panel structure of the data, we employ panel data estimation techniques to examine the firm specific factors of profitability. We begin by estimating pooled ordinary least squares (OLS), fixed effects (FE), and random effects (RE) models. To determine whether firm-specific unobserved heterogeneity is present, we conduct the F-test for individual effects. The test strongly rejects the null hypothesis that all firm-specific effects are jointly zero ($F = 6.00$, $p < 0.01$), indicating that pooled OLS is inappropriate. We subsequently compare the fixed and random effects estimators using the Hausman specification test. The test fails to reject the null hypothesis that the differences in coefficients between the FE and RE estimators are not systematic ($\chi^2 = 13.96$, $p = 0.083$), suggesting that the random-effects estimator is consistent and more efficient in this context. Accordingly, the random-effects model is adopted as the baseline specification. To ensure reliable statistical inference, all regression models are estimated using heteroskedasticity-robust standard errors clustered at the firm level. This approach accounts for potential within-firm serial correlation and heteroskedasticity over time. The results are reported and discussed based on this specification. The post estimation test using Breusch-Pagan LM confirmed fitness of model ($\chi^2 = 56.55$, $p < 0.001$).

Interpretation of Results

FS was negative and significant at $p<0.05$ with low coefficient of 1.12%, contradicts the theoretical perspective that economies of scale should drive profitability. FL was positively significant at $p<0.05$ with huge coefficient of 67.57%. This is a striking evidence of insurance accounting and actuarial theories that treats insurance liabilities such as outstanding claims, unearned premium and incurred but not Yet Reported reserves as debts but are available for investments. This evidence supported that increases in these reserves drove profitability. LIQ was positively significant at $p<0.05$ with low coefficient of 8.29%. This has intricate implication if liquidity boosts profitability because conceptually moderate to low liquidity implies long term assets with potentially higher profitability; however, excessive liquidity could mean idle cash which is detrimental to profitability. Liquidity also reduces borrowing cost. Nonetheless, this study conceptualizes liquidity to be inversely related to profitability in line with investment theory.

For the random-effects baseline model, the within R^2 is 0.308, showing that the model explains approximately 30.8% of the time-series variation in profitability within firms. More notably, the between R^2 is relatively high at 0.698, indicating that nearly 69.8% of the cross-sectional variation in ROA across firms is captured by the model. The overall R^2 of 0.513 confirms that the random-effects specification provides substantial explanatory power, comparable to the pooled OLS model, while appropriately accounting for firm-level heterogeneity. This allows us to accept the alternate hypothesis of the significant joint impact of the eight internal factors on profitability.

Table 5. *Robustness test (Dependent Variable: Return on Equity)*

Variable	Pooled OLS	Fixed Effects	Random Effects
FS	-0.0092*** (-3.70)	-0.0110*** (-3.92)	-0.0096*** (-3.66)
FL	1.1135*** (4.81)	0.8337*** (3.64)	0.9385*** (4.18)
PGR	0.1355** (2.52)	0.0551 (1.08)	0.0760 (1.50)
AC	-0.0096 (-1.58)	0.0316* (1.84)	-0.0022 (-0.21)
RR	0.1030 (.55)	0.0499 (0.27)	0.0193 (0.11)
LR	0.1921** (2.04)	0.0197 (0.23)	0.0852 (0.98)
LIQ	0.1120*** (5.15)	0.0625*** (2.69)	0.0845*** (3.80)
ER	-0.0192 (-1.54)	-0.0219* (-1.83)	-0.0181 (-1.54)
Constant	-0.9304** (-2.46)	-0.3073 (-0.76)	-0.4593 (-1.19)
R^2	0.5996	0.3341 (within)	0.5858 (overall)

Note. Researcher computation, 2024; Standard errors are heteroskedasticity-robust and clustered at the firm level. Significance: p<0.1, *p<0.05, **p<0.01; t-statistics are reported for Pooled OLS and FE; z-statistics for Random Effects. R^2 Within, Between, and Overall are from panel models; pooled OLS reports only overall R^2.

A robustness test was carried out to confirm deftness of the model fit using ROE another measure of profitability. It further affirmed the appropriateness of the random effect employment. FS was significant at $p<0.01$ and low coefficient at 0.96%; but negative contrary to theory, FL was significant at $p<0.01$

with large coefficient of 93.8%; LIQ was also significant at $p<0.01$, with low coefficient of 8.45%. all other variables are insignificant but their signs are relevant for decision-making. PGR and RR were positive which align with theoretical expectation. However, LR was positive which is contrary to theory.

5. Discussion of Findings

This study found FS negatively significant while FL and LIQ were positively significant to profitability. FL stands out at huge coefficient of 67.57% throwing light on adequate provisions for reserves which may have been ploughed into investment to produce profitability. Notably PGR, LR, AC, RR and EXPR were not significant against theoretical expectation. This is incongruent with the study of Guendouz and Ouassaf (2018) which found that age, size, written premium growth rate and loss ratio, have significant effects on the profitability of Takaful insurance companies. Also, Azmi, Irawan and Sasongko, (2020)'s research shows that firm size, liquidity ratio, equity growth, underwriting result, return on investment, input cost, claim ratio, technical ratio, economic growth rates and Bank Indonesia interest rate are significant factors that affect profitability of general insurance companies. This is also inconsistent with the study of Siddik, Hosen, Miah, Kabiraj, Joghee and Ramakrishnan, (2022) which found that financial leverage, technical provision, and age had a noteworthy adverse influence on profitability. Also, Malik (2011) found there was no association between profitability and age of the company, but a significant connection between size of the company and profitability. Furthermore, Hailegebreal (2016) found that the profitability of a company is positively correlated with its age, whereas underwriting risk, technical provision, leverage, and inflation have negative but significant impacts. Our findings were in partial agreement with the study of Abass, Dansu and Oyetayo (2021) on Nigeria non-life insurer's sector. Their study rather revealed mixed findings where reserves, firm size, and premium growth have positive influence except capital adequacy.

6. Conclusion and Recommendations

The study found reasonable evidence to support that the Nigerian non-life insurers' eight specific characteristics jointly influence profitability by 51.3%, which is considered quite high based on insurance management concept. Clearly FS was negatively significant implying net worth of insurance could not employ economies of scale to drive profitability. FL was strikingly important as it was positively significant. The composition of financial leverage in non-life insurance as contingent reserves boosted profitability in line with actuarial theory. LIQ was low and positively significant implying liquidity was appropriately deployed to generate profits. This implies that sound reserving strategy and claims management can sustain profitability in non-life insurance operations. It is suggested that managers and regulators should critically examine why loss ratio and premium growth are irrelevant to profitability contradicting actuarial and insurance accounting theories. Rating of risks should be considered as part of boosters to loss ratio management and premium growth rate. Moderate liquidity should be encouraged as part of risk-based regulations.

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