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Capital Adequacy and Claims Settlement Management in Listed Insurance Companies in Nigeria

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Abstract

The insurance sector plays a crucial role in supporting economic growth by providing risk protection, which is particularly significant in the context of the Nigerian insurance industry. One key factor influencing the efficiency of insurance companies in settling claims is capital adequacy. This study aims to examine the relationship between capital adequacy and claims settlement within the Nigerian insurance sector. Using an ex-post facto research design, study adopted Pearson's Product-Moment Correlation and Multiple Linear Regression method, the study analyzes 15 years of data (2007–2021) from audited financial reports of selected insurance companies sourced from the Nigerian Stock Exchange Database. Capital adequacy is measured by the Shareholders' Fund, while claims settlement is assessed using the Claim Ratio. The findings reveal that effective management of capital adequacy significantly enhances an insurer's ability to settle claims promptly. This improves insurers' ability to meet financial commitments to policyholders, leading to more efficient claim settlements, better overall performance, and a stronger industry reputation. The study recommended to stay abreast of evolving regulatory standards and proactively adapting capital adequacy policies to comply with changing regulatory landscapes, thereby avoiding compliance-related risks.

Keywords: ***Capital adequacy, Claims Settlement, Management, Profitability, Insurance***

1.0 Introduction

The insurance sector plays a critical role in the financial system by providing risk mitigation and financial security through various products and services. One of the most essential functions of insurance companies is claims settlement, which directly affects customer trust, regulatory compliance, and industry stability. However, the efficiency of claims settlement is heavily influenced by capital adequacy, which refers to an insurer's financial strength and its ability to cover potential liabilities (Putra, 2017). Insufficient capital reserves can hinder the ability of insurers to process claims promptly, leading to delays, disputes, and even outright denials. This, in turn, erodes policyholder confidence, weakens the financial stability of insurers, and threatens the overall credibility of the industry.

In developing economies such as Nigeria, capital adequacy remains a persistent challenge, despite regulatory efforts to enforce financial stability (Fracarolli Nunes et al., 2020). The National Insurance Commission (NAICOM) mandates that insurance firms maintain sufficient capital to meet policyholder obligations. However, many firms continue to face capital shortfalls, often worsened by external economic pressures such as inflation, currency depreciation, and financial market instability (Lusmeida& Gunawan, 2025). These factors not only threaten the financial health of insurance companies but also impair their ability to settle claims efficiently, increasing the risk of insolvency and regulatory sanctions (Cevikbas et al., 2024).

Recent advancements in technology have introduced innovative solutions to improve claims processing, fraud detection, and overall efficiency. Digital transformation in the insurance sector has the potential to streamline operations, reduce administrative delays, and enhance accuracy. However, firms struggling with capital adequacy may lack the financial resources needed to invest in these technologies, further exacerbating inefficiencies in claims management (Tarr et al., 2023). The gap between financial capacity and technological adoption highlights a critical limitation, where underfunded insurers are unable to leverage digital transformation to enhance claims processing speed and accuracy.

Despite regulatory frameworks requiring insurers to maintain capital adequacy, inefficiencies in claims settlement remain a persistent issue in the Nigerian insurance industry. While previous studies have explored the relationship between capital adequacy and financial stability, there is limited empirical research on how capital adequacy directly influences claims processing efficiency, particularly in developing markets like Nigeria. Additionally, the role of external economic factors and technological adoption in mitigating these inefficiencies remains underexplored.

This study seeks to fill this gap by investigating the relationship between capital adequacy and claims settlement efficiency in the Nigerian insurance industry. By testing the hypothesis that higher capital reserves enhance an insurer's ability to process claims efficiently, this research aims to provide data-driven insights that can inform policymakers, regulators, and industry stakeholders. The findings will contribute to developing more robust financial and technological strategies to improve claims management processes and strengthen the resilience of the insurance sector.

2.0 Literature Review

2.1 Capital Adequacy

Capital adequacy is a critical measure of an organization's financial strength, reflecting its ability to manage assets effectively while ensuring long-term stability. It serves as an essential benchmark in assessing a firm's financial health, operational resilience, and risk management strategies. Ayuba et al. (2019) illustrate how capital adequacy ratios differ across sectors and countries, emphasizing that variations in regulatory frameworks and

economic conditions impact a company's ability to maintain sufficient capital reserves. Furthermore, Lee (2023) highlights the importance of capital reserves and operational

transparency as key indicators of a firm's competence and strategic foresight, reinforcing the idea that well-capitalized firms are more likely to sustain financial shocks and maintain market confidence. Similarly, Ahmed et al. (2022) stress the importance of capital adequacy in enhancing profitability and customer satisfaction, as companies with robust capital structures can provide reliable services, process claims efficiently, and sustain long-term business growth.

In the insurance industry, capital adequacy plays a pivotal role in ensuring financial stability, particularly in claims settlement and risk management. As Fedoryshyna (2022) emphasizes, financial performance is a significant determinant of insurance profitability because it reflects a company's ability to honor policyholder obligations while remaining solvent. Insurance premiums, collected from policyholders, serve as the primary revenue source for insurers, enabling them to mitigate financial risks associated with claims payments. A crucial aspect of capital adequacy in insurance is risk-based capital, which refers to the minimum amount of funds required to cover potential losses and unforeseen liabilities. Companies that fail to maintain adequate capital reserves risk delays in claims settlement, reduced customer trust, and potential regulatory sanctions.

Studies have examined firm-specific characteristics that influence insurance profitability, such as the net claims ratio and net operating expenses, as outlined (Ben Dhiab; 2021, Ugwu et al.; 2021, and Mbonu &Amahalu2021). The net claims ratio, which measures the proportion of claims paid relative to earned premiums, is a direct indicator of an insurer's ability to meet its financial obligations. A high claims ratio may signal inadequate capital reserves, whereas a lower ratio suggests efficient risk management. Additionally, operating expenses impact profitability by affecting an insurer's cost efficiency in handling claims, underwriting policies, and investing in technological advancements. Understanding capital adequacy in the insurance industry is essential for policyholders, industry professionals, and regulators, as it enables them to assess financial resilience and identify growth opportunities. Effective evaluation of an insurer's financial performance helps policymakers develop regulations that promote stability while allowing firms to optimize their capital structures. Ultimately, recognizing the significance of firm-specific financial factors is a foundational step toward making informed recommendations for enhancing the profitability, sustainability, and competitiveness of the insurance sector.

However, the under-capitalization of the Nigerian insurance market is a significant challenge. For example, foreign corporations are expected to insure 72% of Dangote Refinery's insurance premiums, which are anticipated to be worth 6.8 billion USD. Other high-value energy risks could face a similar fate, with a large portion of insurance premiums flowing abroad. Such examples raise critical concerns about the ability of the local insurance market to adequately cover Nigeria's risks. In response, the National Insurance Commission (NAICOM) has once again urged local insurers to recapitalize their businesses to meet the country's requirements (Oloke, 2023).

Furthermore, new capitalization requirements for Nigerian insurers and reinsurers were introduced. According to the updated criteria, insurers and reinsurers in Nigeria must retain 50% and 60% of the minimum capital requirements by December 31, 2020.

However, only 20 of the more than 50 companies in the market have received shareholder approval to recapitalize their operations. The amount of capital to be injected depends on the financial size of the companies involved, ranging from 5.2 million USD to 25.7 million USD. Ultimately, by September 30, 2021, all market participants were required to raise 100 billion NGN (approximately 257.7 million USD) to meet the regulatory criteria. In response, several corporations have pursued mergers and acquisitions, while others have planned to sell assets to raise the necessary capital (Atlas Magazine, 2020). This ongoing recapitalization process highlights the urgency of strengthening the local insurance market to ensure it can manage Nigeria's growing risk profile, particularly in high-value sectors such as energy and infrastructure. Without significant improvements in capitalization, Nigeria's insurance industry may continue to face challenges in handling large-scale risks, potentially leading to increased reliance on foreign insurers.

2.2 Claims Settlement Management

Kochenburger and Salve (2023) defines an insurance claim as an insurance extract in which the insurer agrees for: Insurance claims are documents in which an insurer agrees to cover the insured against a loss or payment if an event occurs. Insurance is legally binding. The insured's major responsibilities are to pay the agreed-upon premium and follow the policy conditions, whereas the insurer's responsibilities are to follow their own terms and commitments and settle legitimate claims swiftly and equitably. The Nigerian insurance business confronts various challenges, but some of which can be addressed by insurance practitioners with government backing and public understanding. A smart insurance manager must keep an efficient claims department staffed with technically qualified and dependable employees. The insurance industry must ensure timely payments for claims, as claims payment is the largest single cost to insurers. Profit performance measures, such as net premium earned, profitability from underwriting activities, annual turnover, return on investment, and return on equity, are used to measure profitability. However, rising claim expenses have significantly affected the profitability of the insurance sector in Nigeria.

2.3 Theoretical Underpinning

Ruin theory is a fundamental theory within actuarial science and is particularly applicable to understanding the financial stability of insurance companies. Rooted in the broader collective risk theory, ruin theory primarily focuses on the probability that an insurance company will experience ruin (i.e., bankruptcy or insolvency) due to an imbalance between incoming premiums and outgoing claims (Venter, 2020). The origin of this theory can be traced back to the works of early pioneers like Cramér (1930), who explored the risk of ruin in a simplified model of insurance company operations, where premiums and claims follow stochastic processes.
The central premise of ruin theory is that insurance companies operate within a probabilistic environment, where the time evolution of their financial position is influenced by random claims and premium collections. In essence, the insurance

company's financial health is characterized by the interplay of two key stochastic processes:

i. Incoming premiums, which represent a predictable and continuous stream of revenue.

ii. Outgoing claims are variable, dependent on the actions of policyholders, and subject to external risk factors.

Ruin theory assumes that an insurance company's capital reserves fluctuate over time based on these incoming and outgoing cash flows. When the capital of an insurance company reaches a critical negative threshold, it is considered to have "ruined," i.e., it can no longer meet its obligations (Mehalla, 2021). This ruined event, often viewed as the absorption barrier in stochastic processes, is a critical point that decision-makers need to assess when determining the company's financial resilience.

Hence, the relevance ruin theory is that it is highly relevant to the study of capital adequacy and risk management in the insurance industry. The theory is applied to model and evaluate the probability of an insurance company's ruin given its capital structure, premium income, and claims liabilities. Specifically, it helps assess how the company should balance its capital reserves to minimize the likelihood of insolvency under various risk scenarios. This is especially pertinent for understanding the financial stability of insurance companies operating in environments like Nigeria's, where recapitalization efforts and liquidity management are critical to the survival of firms in the face of fluctuating economic conditions and high-risk exposures.

The importance of ruin theory in the insurance industry stems from its focus on stochastic processes, providing insurers with a quantifiable way to manage risk. By calculating the probability of ruin, insurers can optimize their capital reserves, adjust their pricing strategies, and ensure they can cover large and unexpected claims without collapsing. This ties into the need for adequate capital reserves to withstand financial shocks, as emphasized in the earlier discussion of capital adequacy.

The use of ruin theory is justified in this context due to its capacity to quantify financial risks and provide actionable insights into how insurance companies can design their capital structures to avoid insolvency. Insurance companies operate in a high-risk environment, where uncertainty is inherent, and claims payouts are unpredictable. Ruin theory offers a way to incorporate this uncertainty into risk management strategies, making it an invaluable tool for assessing the long-term sustainability of an insurance company's operations. By applying ruin theory, insurance firms can make data-driven decisions to optimize their reserves, ensuring they remain solvent even under adverse conditions, such as high claim volumes or economic downturns.

The theory is relevant for Nigerian insurers as they face new recapitalization requirements. The theory provides a solid foundation for understanding the need for adequate capital to prevent ruin, especially given the challenges posed by undercapitalization in the Nigerian insurance market. Without robust capital reserves, insurance firms may struggle to meet regulatory criteria or, worse, face insolvency, which highlights the practical application of ruin theory in the current landscape.

2.4 Empirical Review

The role of insurance in driving economic growth is widely recognized, with the timely settlement of claims being an essential factor in ensuring insurers uphold their commitments. However, empirical research suggests that the direct impact of claims settlement on Gross Domestic Product (GDP) remains modest, indicating that the relationship between claims settlement and economic development is influenced by various country-specific conditions and the broader performance of the insurance sector.

Falade and Oyedokun (2022) conducted a study in Nigeria exploring the influence of variables such as net claims, net premiums, expense ratios, and risk-based capital on the financial performance of insurance companies. Their findings indicated that these factors significantly influence the financial performance of insurance firms. They recommend that insurers adopt comprehensive strategies to manage these variables effectively. The study highlights the importance of cross-departmental collaboration to mitigate fraudulent claims and expedite the processing of legitimate claims, enhancing overall financial performance.

Moreso,Olarinre et al. (2020) examined the relationship between claims management and profitability within listed insurance companies in Nigeria. Using statistical analysis, the study revealed a negative relationship between profitability and the loss ratio and net claims. In contrast, a positive correlation was found between profitability and the expense ratio. While this finding may initially seem counterintuitive, it suggests that a more efficient handling of claims, leading to lower operational costs, could positively impact profitability despite higher expenses in some cases.

Nyarangi and Ngali (2021) investigated the link between risk management practices and profitability in the insurance industry using regression analysis. Their results confirmed that robust financial, operational, and strategic risk management practices positively influence the profitability of insurance firms. Additionally, their study found that reinsurance significantly boosts premium income, establishing a direct connection between the use of reinsurance and improved profitability. This is in line with the broader argument that risk-sharing strategies, such as reinsurance, can enhance the financial stability of insurance companies.

A comparative study across Kenya, Uganda, and Tanzania examined the influence of underwriting and claims management practices on insurance company performance. The research revealed a direct and significant relationship between underwriting and claims management practices and non-financial performance metrics, such as customer satisfaction and operational efficiency. However, a weaker correlation was observed with financial performance, suggesting that effective claims and underwriting management may enhance operational outcomes without necessarily improving short-term financial returns.

A study conducted in Indonesia on the impact of net premium growth, claim ratio, and risk-based capital on the financial performance of life insurance companies yielded surprising results. The factors, contrary to expectations, did not significantly affect financial performance. Moreover, these variables were found to have a negative impact

on profitability, indicating that maintaining high levels of risk-based capital might constrain profitability in certain contexts, especially in markets with low premium growth.

In Nigeria, Salaudeen, Salam, and Mudashiru (2021) focused on the effects of net claims ratio and net retention ratio on the financial performance of insurance companies. Their findings suggested that these factors did not significantly affect the financial performance of Nigerian insurers. The study proposed that insurance executives should reconsider their perception of reinsurance as a cost center, highlighting its role as a crucial risk management tool for mitigating financial risk.

Similarly, Ogunnubi and Micheal (2018) examined the influence of claims management on the profitability of non-life insurance companies in Nigeria. Their research identified a significant association between claims management and operating costs, although no direct relationship was found between claims management and profitability. The authors recommended that claims management departments be staffed with skilled and experienced personnel to ensure claims are handled efficiently, thus minimizing operational costs.

An empirical study by Yusuf, Ajemunigbohun, and Alli (2017) investigated the effects of different claims handling processes on insurance companies in Nigeria. The findings revealed that various claims handling processes have a substantial impact on the efficiency of claims management procedures. The study recommended that claims managers implement strategic plans, adopt modern training methods, and align resources and expertise to combat fraudulent claims effectively.

Oyedokun and Amafa(2022) examined the relationship between claims management, risk management, and financial performance in the Nigerian insurance industry. The authors found that factors such as underwriting techniques, premium valuation, net claims worth, and the claim ratio play an essential role in enhancing risk management practices. Furthermore, the study suggested that adjusting claims and benefits provided to policyholders not only adds value to investments but also contributes to improving the overall financial performance of insurance firms. Their findings underscore the importance of implementing premium valuation methods to ensure financial stability and enable informed decision-making within these organizations.

The contribute significantly to understanding the factors affecting the financial performance of insurance companies, but there remain knowledge gaps that warrant further research. Future studies should focus on examining the impact of capital adequacy on the operational performance of insurance companies in Nigeria. Capital adequacy, which refers to the minimum capital required to absorb potential losses and ensure solvency, has significant implications for both risk management and profitability. Despite its importance, limited empirical research has directly explored how capital adequacy influences the operational performance of insurers in Nigeria.

Furthermore, future research should explore the potential impact of capital adequacy risk on insurance company performance. It is important to investigate whether higher capital requirements correlate with greater operational efficiency or whether they hinder

profitability by constraining insurers' ability to invest in growth opportunities. Additionally, researchers should utilize larger sample sizes to increase the generalizability and reliability of their findings. Regulatory changes should also be considered, as stricter capital adequacy regulations may enhance the stability of the sector but could also lead to reduced efficiency in certain cases. Policymakers and insurance entities must carefully evaluate the implications of capital adequacy risk ratios to make informed decisions regarding future regulatory standards.

3.0 Methodology

3.1 Research Design

This study adopts a descriptive survey research design, which involves the collection of data for the purpose of describing and interpreting existing situations regarding capital adequacy and its effect on the performance of Nigerian insurance companies. To achieve this, the study employs an ex-post facto design, utilizing 15 years of time series data (2007–2021). This design is chosen as it allows for the investigation of relationships between variables without manipulation, where historical data from the companies' audited financial reports is used to examine the impact of capital adequacy on claim settlement.

3.2 Population of the Study

The target population for this study consists of all publicly listed insurance companies in Nigeria. For this study, 10 insurance companies are selected from the list of public insurance firms in Nigeria. Hence, the study period covers 15 years, from 2007 to 2021, ensuring a comprehensive time frame for analysis.

3.3 Sample Size and Sampling Technique

The companies are selected through random sampling, ensuring a broad representation of the industry. This selection represents a spread across the various tiers of the insurance industry, including both large and medium-sized insurers, and is justified by the availability of reliable secondary data from these companies.

The selected companies include NEM Insurance Plc, Consolidated Hallmark Insurance, Royal Exchange General Insurance, Mutual Benefits Assurance Plc, Guinea Insurance Plc, Lead way Assurance Plc, Axa Mansard Plc, AIICO Insurance Plc, Cornerstone Insurance Plc, AXA Mansard Insurance Plc. Thus, the study period covers 15 years, from 2007 to 2021, ensuring a comprehensive time frame for analysis.

3.4 Method of Data Collection

Secondary data are employed in this study, as they provide access to reliable, historical financial information from audited annual financial reports of the selected insurance companies. The secondary data are obtained from the Nigerian Stock Exchange (NSE) database and the official websites of the selected insurance companies.

The reason for using secondary data is that it ensures accuracy and reliability, particularly for financial information, as the data are certified by auditors and are publicly available. Moreover, secondary data allow the researcher to avoid the ethical and safety risks that would be involved in direct observation methods.

3.5 Method of Data Analysis

To analyse the data, the study employed the following statistical techniques:

i. Pearson's Product-Moment Correlation: This will be used to assess the strength and direction of the linear relationship between the independent variable (capital adequacy) and the dependent variable (claim settlement). This correlation analysis will help determine if there is any significant association between the two variables.

ii. Multiple Linear Regression: Since the study is examining the impact of capital adequacy on claim settlement, a multiple linear regression model will be used. The regression analysis will help understand the magnitude of the effect of capital adequacy on claim settlement while controlling for other potential factors that may influence claim settlement, such as company size or market conditions. The general form of the regression model.

3.6 Model Specification

Two main variables are central to this study:

i. Capital Adequacy (Independent Variable): This is measured using the shareholders' fund, which is derived from the sum of issued share capital, retained earnings, and reserves from the companies' financial statements.

ii. Claim Settlement (Dependent Variable): This is measured by the Claim Ratio, which is the proportion of claims paid relative to earned premiums, as reported in the companies' financial statements.

These variables are chosen based on relevant literature and their availability in secondary data sources. They have been widely used in previous studies that investigate the relationship between insurance companies' capital adequacy and performance.The data was analysed using Pearson's product-moment correlation and logistic regression instrument. To recognise the relationship existing between the independent and dependent variables, the regression was adopted, and equations were formed through the influence of the independent variables and dependent variables the general form of the model adopted was:

Financial Performance (Y) = $\alpha_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + e$……..

Where β_1, β_2, β_3, β_4, β_5 = represents the coefficients for the independent variables.

α_0 = represents the intercept for X variable of capital adequacy

The following conceptual model was for this study:

$SF = \alpha + \beta_1 CR + \beta_2 X_i \ \varepsilon$

Where:

CA = Shareholders' Fund being a proxy for capital adequacy

CR = Claims Ratio.

X_i is a vector of relevant control variables, which include the following:

PR = is the Profitability Ratio.

CA = Capital Adequacy.

ROA = Return on Assets.

ROE = Return on Equity

TR = Turnover.

α represents the autonomous component of the model

β_i, are Regression Coefficients or Parameters.
ε is the Error Term.

4.0 Results and Discussion

Table 1 provides descriptive statistics for both the explained and explanatory variables. It is based on the information gathered for this investigation. Descriptive statistics, the unit root test, the co-integration test, and regression analysis were all used to analyse the data.

4.1 Descriptive Statistics

	CR (Claim Ratio)	SF (Shareholders' Fund)
Mean	-0.301963	109551402
Median	-0.319100	7431968
Maximum	0.586100	80653042
Minimum	-1.300800	1623717
Std. Dev.	0.323566	11772555
Skewness	-0.349675	3.325237
Kurtosis	3.404503	16.43867
Jarque-Bera	3.671512	1264.651
Probability	0.159493	0.000000
Sum	-40.76500	1.4E+09
Sum Sq. Dev.	14.02912	1.86E+16
Observation	135	135

Source: *Researchers' Computation using E-view 12*

The descriptive statistics offer valuable insights into the characteristics of the two key variables, Claim Ratio (CR) and Shareholders' Fund (SF), crucial for understanding the performance of Nigeria's insurance companies.

For the Claim Ratio (CR), the average value falls slightly below zero, suggesting that, on average, insurance companies settle claims at a rate slightly lower than their premiums earned. The distribution of CR values appears symmetric, with a median close to the mean. However, the range of CR values varies significantly, from negative values indicating claim payments exceeding premiums to positive values suggesting the opposite. The moderate standard deviation implies moderate variability among insurance companies in terms of their claim ratios. The slightly negative skewness indicates a distribution with more extreme values on the lower end, while the positive kurtosis signifies a distribution with heavier tails and sharper peaks compared to a normal distribution. Although the Jarque-Bera test suggests a deviation from normality, it's not statistically significant.

Turning to Shareholders' Fund (SF), the mean value indicates an average fund size of approximately 10.95 million units. However, the median is lower than the mean, indicating a slight right skewness in the distribution, with some higher values pulling the median upwards. The range of SF values is considerable, from a minimum of 1.62 million to a maximum of 80.65 million. The standard deviation reflects significant variability

among insurance companies concerning their shareholders' funds. The positive skewness reveals a distribution skewed to the right, with more extreme values on the higher end. Moreover, the high kurtosis indicates a highly leptokurtic distribution with heavy tails and a sharp peak. The Jarque-Bera test confirms a significant deviation from normality, suggesting a non-normal distribution of SF values.

4.2 CORRELATION ANALYSIS

Covariance Analysis: Ordinary
Date: 06/01/24 Time: 15:18
Sample: 1 135
Included Observation: 135

Correlation	CR	SF
CR	1.000000	
SF	-0.419708	1.000000

Source: *Researchers' Computation using E-view 12*

The correlation analysis between the two variables, Claim Ratio (CR) and Shareholders' Fund (SF), reveals a moderately strong negative correlation coefficient of approximately -0.42. This indicates that there is a negative relationship between the two variables: as one variable increases, the other tends to decrease, and vice versa.

In this context, the negative correlation suggests that insurance companies with higher shareholders' funds tend to have lower claim ratios, and vice versa. This implies that companies with healthier financial positions, reflected in larger shareholders' funds, may be more capable of managing their claim payments effectively, resulting in lower claim ratios. Conversely, companies with lower shareholders' funds may face greater challenges in settling claims promptly or in full, leading to higher claim ratios.

Understanding this negative correlation is crucial for assessing the financial health and operational efficiency of insurance companies in Nigeria. It suggests that improving capital adequacy and strengthening shareholders' funds may contribute to better claims management practices, ultimately enhancing the overall performance and stability of the insurance industry.

4.3 Unit Root Test

Tests	CR		SF	
	Statistic	Prob.**	Statistic	Prob.**
ADF	-5.83625	0.0000	-4.3375	0.0005
PP	-5.87467	0.0000	- 4.4080	0.0005
Order of integration	I(0)		I(0)	

Source: *Researchers' Computation using E-view 12*

The unit root test results indicate that both variables, Claim Ratio (CR) and Shareholders' Fund (SF), exhibit stationarity after differencing. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test statistics for both variables are significant at the 1% level, with p-values close to zero. This suggests strong evidence against the null hypothesis of non-stationarity, indicating that the series are stationary after differencing.

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The order of integration for both variables is determined to be I(0), indicating that they are integrated of order zero after differencing. This implies that both CR and SF series do not have unit roots and are stationary in their first differences.

These findings are essential for time series analysis, as they confirm that the variables exhibit stable behaviour over time, which is necessary for reliable statistical inference and modelling.

4.4 CO-INTEGRATION RESULT

Date	06/01/24, Time: 15:39
Sample (adjusted)	6 to 135
Included observations	130 after adjustments
Trend assumption	Linear deterministic trend
Series	CR, SF
Lags interval (first differences)	1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	ElgenValue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.130948	35.00465	15.49471	0.0000
At most 1 *	0.120951	16.75888	3.841466	0.0000

Trace test indicates 2 cointegrating equation(s) at the 0.05 level.
*denotes rejection indicates 2 cointegrating eqns) at the 0.05 level
** Mackinnon-Haug-Michelis (1999) p-value

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	ElgenValue	Max-Eigen Statistic	0.05 Critical Value	Prob. **
None *	0.130948	18.24577	14.26460	0.0111
At most 1 *	0.120951	16.75888	3.841466	0.0000

Max-eigenvalue test indicates 2 cointegrating equation(s) at the 0.05 level.
*denotes rejection indicates 2 cointegrating eqns) at the 0.05 level

** Mackinnon-Haug-Michelis (1999) p-value

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I)

CR	CSF
3.593548	1.103E-07
2.956815	-5.46E-08

Unrestricted Adjustment Coefficients (alpha):

D(CR)	-0.038919	-0.085071
D (SF)	-2002258	2109088

Cointegrating Equation(s)	Log likelihood	-2246.297

Normalized cointegrating coefficients (standard error in parentheses):

CR	SF
1.000000	2.88E-08
	(7.1E-09)

Adjustment coefficients (standard error in parentheses):

D(CR)	-0.139858
	(0.086872)
D(SF)	-7.195802
	(2611892)

Source: Researchers' Computation using E-view

The co-integration test results suggest the presence of two co-integrating equations at the 0.05 significance level. Both the Trace test and the Max-Eigenvalue test indicate the rejection of the null hypothesis of no co-integration, implying that there are co-integrating relationships between the variables CR (Claim Ratio) and SF (Shareholders' Fund).

The coefficients of the co-integrating equations provide insights into the long-term relationship between the variables. In this case, the coefficients represent the weights of the variables in the co-integrating equations. For CR, the coefficients are approximately

3.593548 and 2.956815, while for SF, the coefficients are approximately 1.03E-07 and -5.46E-08.

These coefficients suggest that there exists a long-term equilibrium relationship between CR and SF. Specifically; the coefficients indicate the adjustment speed of the variables towards their equilibrium relationship when they deviate from it. The positive coefficient for CR suggests that an increase in CR leads to an increase in SF in the long run, while the negative coefficient for SF suggests that an increase in SF leads to a decrease in CR in the long run.

These co-integration results imply that CR and SF move together in the long term and share a stable relationship, which is crucial for understanding their joint behaviour and forecasting future movements.

4.5 Regression Analysis

Dependent Variable CR

Method Least Squares

Date 06/01/24

Time 15:52

Sample 1 to 135

Included observations : 135

Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
C	-0.175632	0.034712	-5.059725	0.0000
SF	-1.15E-08	2.16E-09	-5.332737	0.0000
R-squared	0.176155	Mean dependent var		-0.301963
Adjusted R-squared	0.169960	S.D. dependent var		0.323566
S.E. of regression	0.294790	Akaike info criterion		0.409594
Sum squared resid	11.55782	Schwarz criterion		0.452636
Log likelihood	-25.64762	Hannan-Quinn criterion		0.427085
F-statistic	28.43808	Durbin-Watson stat		0.847815
Prob(F-statistic)	0.000000	Mean dependent var		-0.301963
R-squared	0.176155			

Source: *Researchers' Computation using E-view*

The regression analysis was conducted to examine the hypothesis that effective capital adequacy risk management does not impact the effective claim payment of an insurance company.

The results of the regression analysis revealed that the coefficient for Shareholders' Funds is statistically significant with a negative value. This indicates that there is a significant negative relationship between Shareholders' Funds (proxy for effective capital adequacy risk management) and the Claims Ratio (proxy for effective claim payment).

The results indicate that when the Shareholders' Fund is zero, the expected value of the Claim Ratio is approximately -0.176. Additionally, for every unit increase in Shareholders' Fund, the Claim Ratio is expected to decrease by approximately 1.15E-08 units. In other words, as the level of Shareholders' Funds increases, the Claims Ratio tends to decrease, suggesting more effective claim payment.

Regarding the model's performance, around 17.6% of the variability in Claim Ratio can be explained by Shareholders' Fund, as indicated by the R-squared value. The F-statistic shows that the overall regression model is statistically significant, meaning that at least one independent variable significantly contributes to explaining the dependent variable.

The Durbin-Watson statistic suggests the presence of autocorrelation, which might affect the reliability of the model's predictions. Additionally, various criteria such as the Akaike Information Criterion and Schwarz Criterion provide measures of model fit, with lower values indicating better fit.

Given this result, we reject the null hypothesis that effective capital adequacy risk management does not impact effective claim payment. Instead, we accept the alternative hypothesis that effective capital adequacy risk management does indeed influence effective claim payment in insurance companies.

4.6 Discussion

The comprehensive analysis conducted, incorporating descriptive statistics, correlation, unit root test, co-integration, and regression analyses, offers valuable insights into the relationship between effective capital adequacy risk management and claim payment in insurance companies. The findings are discussed below, supported by relevant literature.

Descriptive statistics provide a summary of the variables under investigation. In this study, the mean, median, minimum, and maximum values of the Claims Ratio (CR) and Shareholders' Funds (SF) were computed. The skewness and kurtosis measures indicate the distributional characteristics of the data. The findings suggest a wide variation in both CR and SF over the observation period, reflecting the dynamic nature of the insurance industry. This aligns with previous studies highlighting the variability in financial performance and risk exposure among insurance firms (Kiptoo etal,. 2021); (Fali et al., 2020).

The correlation analysis reveals the strength and direction of the relationship between CR and SF. The negative correlation coefficient suggests an inverse relationship between

capital adequacy and claim payment efficiency. This finding is consistent with prior research indicating that higher levels of capital adequacy are associated with lower claims ratios, reflecting better risk management practices and financial stability (Harkati et al., 2020); (Al Zaidanin & Al Zaidanin, 2021). The negative correlation implies that as SF increases, CR decreases, indicating more effective claim payment processes in insurance companies with stronger capital reserves.

The unit root test examines the stationarity properties of the variables. The results indicate that both CR and SF are stationary at the level, implying that they do not exhibit a unit root and are integrated of order zero. Stationarity is crucial for time series analysis as it ensures the stability of the data over time (Salaudeenet et al., 2021). The findings support the validity of the regression analysis, indicating that the relationships observed are not spurious but based on genuine underlying patterns in the data.

Co-integration analysis explores the long-term relationship between CR and SF. The results suggest the presence of co-integration between the variables, indicating a stable equilibrium relationship. This finding is consistent with theoretical expectations, as capital adequacy is expected to influence claim payment efficiency over the long run (Owolabi et al., 2017). Co-integration implies that changes in SF have a lasting impact on CR, highlighting the importance of maintaining adequate capital reserves to ensure effective claim settlement.

The regression analysis provides further insights into the relationship between CR and SF. The negative coefficient of SF indicates that higher levels of capital adequacy are associated with lower claims ratios, supporting the hypothesis that effective capital adequacy risk management influences claim payment efficiency. This finding is in line with previous research emphasizing the role of capital adequacy in enhancing the financial stability and operational efficiency of insurance companies (Yusuf & Ajemunigbohun, 2015); (Falade & Oyedokun, 2022).

The findings of this study provide empirical evidence supporting the hypothesis that effective capital adequacy risk management significantly impacts claim payment efficiency in insurance companies. The results underscore the importance of maintaining adequate capital reserves to ensure prompt and effective claim settlement processes, thereby enhancing customer satisfaction and trust. These findings contribute to the existing body of literature on risk management and financial performance in the insurance sector, offering valuable insights for policymakers, regulators, and industry practitioners.

5.0 Conclusion & Recommendations

The results offer compelling evidence that effectively managed capital adequacy significantly enhances insurance companies' efficiency in settling claims. A sufficient level of capital ensures that insurers can meet their financial obligations to policyholders promptly. Future research should focus on exploring the broader impact of capital adequacy on the operational efficiency of Nigerian insurance firms. The study therefore recommended that insurers stay abreast of evolving regulatory standards and proactively

adjust their capital adequacy policies to align with changing regulatory requirements, thereby avoiding compliance-related risks.

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