Impact of Exchange Rate Volatility on Insurance Premium Pricing and Claims Payout in Nigeria

Shuaib Abdulyakeen[1], Prof. Idris Ahmed Aliyu[2], Dr Halimah Sani Sambo[3] & Prof. Tijjani Bashir[4]

Department of Actuarial Science and Insurance[1,2,3]
Department of Finance[4]
Faculty of Management Sciences Ahmadu Bello University Zaria

Abstract

This study investigates the influence of exchange rate volatility on insurance premium pricing and claims payouts in Nigeria, with a focus on the period 2014–2024. Using time series data analyzed through EViews 13, the study employed Ordinary Least Squares (OLS) regression to assess the relationship between exchange rate fluctuations, insurance premiums, and claim payouts. Results reveal that while exchange rate volatility negatively influences both premium pricing and claims, these relationships are statistically insignificant. Diagnostic tests affirm the models' robustness, although the RESET test suggests potential specification issues in the premium pricing model. The findings imply that Nigeria's insurance sector may be more influenced by local risks and structural factors than macroeconomic volatility. The study recommends extending the data range and incorporating additional variables to enhance model precision. These insights are crucial for insurers and policymakers in developing effective risk management strategies and enhancing public confidence in the Nigerian insurance industry.

1.0 Background to the Study

The insurance industry is an important sector within the broader financial system of any economy. This industry plays a critical and indispensable role towards achieving economic growth and development, serving as a financial safety net that helps individuals and businesses manage inherent risks and uncertainties (Panchal & Rao, 2024). The working of insurance which enables the transfer of potential unforeseen risks to insurance firms, significantly reduces the possibility of economic agents facing bankruptcy, thereby protecting against system risks that could lead to financial losses, recession, or crises (Abdul Jabbar et al., 2024)

This function has become increasingly pronounced in recent decades, particularly in the face of escalating global uncertainties such financial crises, health pandemic like COVID-19, climate change and structural break such as subsidy withdrawal, which often contribute to greater volatility in macroeconomic indicators (Rohman et al., 2023). Beyond risk coverage, the insurance industry actively contributes to broader economic development by stimulating the

adoption of other financial products, like savings and investments as well as fostering significant backward linkages with other crucial sectors like banking, manufacturing among others (Rohman et al., 2023).

Understanding the interrelationship between macroeconomic variables and the performance of the insurance sector is paramount to its sustainable growth and stability (Rohman, Ronaldo, & Siregar, 2023). Notable macroeconomic indicators, including real Gross Domestic Product (GDP), inflation, interest rates, and exchange rates, have been identified as having a significant role in determining both gross premium and claims within the insurance industry (Rohman et al., 2023; Simionescu & Ulbinaitė, 2021). Research consistently indicates that real GDP and inflation tend to have a positive relationship with gross premiums, indicating increased affordability and demand for risk mitigation during economic expansion or period of rising prices (Fortune, 1973; Dragota et al., 2023; Rohman, Ronaldo, & Siregar, 2023; Zerriaa & Noubbigh, 2016; Olarewaju & Msomi, 2021).

However, exchange rates, a major focus of this study, generally exhibit a negative and significant relationship with insurance premiums (Rohman, Ronaldo, & Siregar, 2023). This negative impact implies that a weaker local currency against foreign currencies can suppress insurance premiums, as it increases uncertainty and instability, thereby reducing the public's willingness to purchase insurance products (Rohman, Ronaldo, & Siregar, 2023). This seems contrary to Nigeria's scenario as we witnessed high volatility in our local currency between 2023 and 2024 due to the Naira floatation that saw our currency being exchanged against U.S Dollar in the ratio of an average of ₦1,500 to $1 as a result of this many individuals and organizations could not afford some of their basic necessities given the fact that Nigeria is an import dependent country. However, and during this same period, the Nigerian insurance sectors recorded significant increase in their gross premiums. While macroeconomic variables are shown to influence claims, their dynamic impact is less effectively explained by these factors, suggesting the importance of non-macroeconomic elements in claims modeling.

Despite the crucial role of insurance, Nigeria faces significant challenges in it insurance sector. The Nigerian insurance industry ranks 62nd globally, accounting for a mere 0.2% of total global premiums in 2018, where a large majority of the population approximately 70% remains uninsured (Kolapo et al., 2022; vanguardngr, 2019) as a result of various issues such as inappropriate pricing, poor product-market fits, insufficient distribution channels among others.

Central to these challenges is the pervasive issue of exchange rate volatility in Nigeria, which has profound implications for the entire economy and, specifically, the insurance market. The Naira has experienced substantial depreciation over the past decade, from NGN158.6/US$ in 2014 to an

average N645/US$ in 2023, and even reaching N1650/US$ in early 2024 (Edem et al., 2022; Offiong et al., 2020). This type of volatility introduces significant uncertainty and risk for institutions, particularly those involved in foreign transactions like insurance companies (Offiong, et al., 2020). While theory suggests that exchange rate volatility should negatively impact financial sector performance, leading to losses, reduced investments, and decreased premium collection(Raifu & Farayibi, 2022), empirical evidence in Nigeria presents a mixed picture, with some studies even indicating a positive long-run impact on insurance penetration and density (Etim et al., 2020; Mahmood et al., 2011). This counterintuitive finding is often linked to the peculiar nature of Nigeria's financial system, characterized by multiple and undefined exchange rate regimes which might allow the insurance subsector to benefit from arbitrage opportunities amidst the instability (Etim et al., 2020). However, other research consistently shows that exchange rate volatility negatively affect productivity and overall economic growth in Nigeria, primarily by increasing input costs for import-dependent industries and escalating operating expenses for businesses (Orisdare & Olofin, 2024).

The direct and indirect effects of this volatility extend to fundamental insurance operations, notably claims modeling and premium pricing. Accurate modeling of claims data and determining appropriate premiums are vital responsibilities for insurance business (leosanurak, Khomkham, & Moumeesri, 2023; Kartikasari, 2016). Traditionally, premiums may have been based solely on claims frequency, which can lead to unfair outcomes if claims severity is not considered (Moumeesri & Pongsart, 2022). Therefore, understanding how exchange rate volatility specifically impacts insurance claims and premium pricing is crucial for developing robust risk management system that could address some of the persistent issues in Nigerian insurance industry.

1.1 Statement of the problem

The insurance sector serves as a vital financial mechanism in economies worldwide, enabling individuals and businesses to mitigate risks and uncertainties, thereby protecting against potential financial disruptions (Rohman et al., 2023; Olamide et al., 2022). In Nigeria, however, the industry grapples with persistent challenges, including limited access to information, regulatory weaknesses, low public awareness of insurance products, suboptimal premium pricing, mismatched product offerings, and inadequate distribution networks (Leadway Assurance, 2022).

A key factor among these issues is exchange rate volatility, which has profound implications for the sector's core operations, particularly in the areas of insurance premium pricing and claims payout (Orisdare & Olofin, 2024; Oaikhenan & Aigheyisi, 2015; Offiong et al., 2020). Notably, a significant percentage of insurance operations in Nigeria are foreign currency dependent. For

instance, approximately 30-40% of total premiums in Nigeria are derived from foreign currency-denominated policies, primarily in the oil and gas sector, where naira devaluation inflates reported values but introduces pricing instability (Agusto & Co., 2024).

Similarly, claims in these classes often involve 50% or more foreign currency exposure due to imported parts and international settlements, while reinsurance cessions to foreign entities account for about 65% of the market, predominantly in hard currencies like the US dollar, heightening payout pressures amid volatility (Africa Re, 2017; Vanguard, 2017). The primary foreign currency-dependent classes include marine, aviation, oil and gas, and energy insurance, which rely heavily on international trade, imported equipment, and global reinsurance arrangements (GlobalData, 2024; NAICOM, 2023).

Exchange rate volatility poses significant problems for premium pricing in Nigeria's insurance industry. Specifically, fluctuations in the naira against major foreign currencies introduce uncertainty in cost projections, as many insurers rely on imported resources, reinsurance contracts denominated in foreign currencies, and international investments. This volatility often leads to inaccurate premium calculations, resulting in either underpricing—which erodes profitability and increases insolvency risks—or overpricing, which deters potential policyholders and suppresses overall premium collection (Rohman et al., 2023; Singhal et al., 2020; Hosseinzadeh & Daei-Karimzadeh, 2017; Raji & Adejuwon, 2021).

Empirical evidence indicates a generally negative relationship between exchange rate volatility and insurance premiums, as a depreciating local currency heightens economic uncertainty and reduces consumer willingness to invest in insurance (Etim et al., 2023; Offiong et al., 2020).

Similarly, claims payout processes are severely hampered by exchange rate volatility. Insurers face escalated costs when settling claims involving foreign-denominated obligations, such as those related to imported medical equipment, vehicle parts, or international reinsurance recoveries. This can lead to delays in payouts, higher operational expenses, and inadequate compensation for policyholders, ultimately undermining service delivery and public confidence in the sector (Etim et al., 2023; Ipigansi & Egoro, 2022).

Studies in Nigeria reveal that while exchange rate volatility may have a non-significant negative effect on premiums and investments, it exerts a positive and significant influence on claims volumes, implying increased payout pressures amid currency instability (Etim et al., 2023; Raji & Adejuwon, 2021).

These problems—manifesting as operational inefficiencies, eroded profitability, delayed or insufficient claims settlements, and diminished consumer trust—are paradoxically juxtaposed against apparent increases in insurance uptake despite Nigeria's volatile exchange rate

environment. Available data from insurance firms suggest that the expected adverse impacts may not fully align with observed trends, highlighting a critical knowledge gap. Thus, an empirical examination of how exchange rate volatility affects premium pricing and claims payout is essential to unravel these dynamics and inform strategies for enhancing the sector's resilience and contribution to Nigeria's economic stability.

This operational strain, stemming from exchange rate fluctuations, can further erode public confidence and hinder effective service delivery. Therefore, the fundamental problem is that the pervasive and often adverse exchange rate volatility is Nigeria severely complicates insurance companies' ability to accurately price premiums and manage claims effectively. This leads to operational inefficiencies and directly contributes to eroding public trust and confidence in the insurance industry. However, available data from the insurance firms amidst Nigeria's highly volatile exchange rate does not seem to support this. Hence, an empirical investigation of the impact of exchange rate volatility on insurance premium pricing and claims payout is important for a better and comprehensive understanding of this dynamics.

1.3 Objectives of the Study:

The objectives of this study are derived from the identified paradoxical problem of exacerbated exchange rate volatility and an increased uptake in insurance activities in Nigeria, so the study aimed to investigate the specific role of exchange rate volatility in impacting insurance operations. This research aims to contribute to a deeper understanding of these dynamics and their broader implications for Nigeria's economic stability. Specifically, the objectives of this study are:

To evaluate the impact of exchange rate volatility on insurance premium pricing in Nigeria

To analyze the influence of exchange rate volatility on insurance claim payouts in Nigeria

To achieve these objectives, the following research questions were asked:

How does exchange rate volatility influence insurance premium pricing in Nigeria?

How does exchange rate instability affect insurance claim payout in Nigeria?

The following hypotheses will be tested in order to empirically answer these research questions:

H01: Exchange rate volatility has no significant influence on insurance premium pricing in Nigeria

H02: Exchange Rate instability does not significantly affect insurance claim payout in Nigeria.

1.4 Scope of the Study

The scope of this study encompasses a comprehensive analysis of the Nigerian insurance sector, specifically investigating the impact of exchange rate volatility on both life and non-life insurance claims and premium pricing. This research will examine data spanning from 2014 to 2024, a

period characterized by significant Naira depreciation and heightened exchange rate volatility in Nigeria as a result of the local currency floatation.

1.5 Significance of the Study

This study holds significant implications for insurers by providing crucial insights into how exchange rate volatility directly impacts their ability to accurately price premiums and mange claim payouts, which is essential for developing robust risk management systems and ensuring operational efficiency and financial stability. Policymakers are also expected to benefit from this study as the findings underscore the necessity of implementing stable and unified exchange rate regime and controlling other macroeconomic variables to mitigate adverse impacts on the insurance sector, thereby fostering public trust and contributing to overall financial system stability and economic development in Nigeria. Researchers will, also benefit from this study by filling a critical gap in the existing literature, particularly concerning the under-explored relationship between exchange rate volatility and its effects on both insurance claims and premiums in the unique context of Nigeria, thus providing a foundation for future empirical investigations.

2.0 Literature Review

2.1 Concept of Exchange Rate Volatility: This concept had been defined in many ways, which basically refers to the unpredictable and often significant fluctuations in a currency's value that introduces considerable uncertainty and risk into various economic activities. Aigheyisi (2021) viewed it as the risk or the uncertainty regarding the unpredictable changes over time on the exchange rate. While Mandeij (2020), defined it as wide fluctuations of the exchange rate around its equilibrium value. It will be measured in this study by looking at the historical value of the Naira to Dollar rate for all the years that are covered in this study.

2.1.2 Concept of Premium Pricing: Moriah et al., (2023) defined premium pricing as te amount of money that an individual or business must pay for an insurance policy, which serves as an income for the insurance company and also represents a liability in that the insurer must provide coverage for claims being made against the policy. Kartikasari (2024) , defined premium pricing or premium determination, as a core activity in insurance, which involves calculating premiums from the expected value of the risks or losses that the insurance company will cover.

2.1.3 Concept of Insurance Claims: according to Goswami (2025), insurance claims can be described as all the activities geared towards monitoring insured's compensation, restitution, repayment or any other remedy for loss or damage or in respect of doing their obligations. Similarly, Adefulu and Banmore (2023) viewed insurance claims management as an activity that

consists of the departmental stipulation, corporate policies and industry practices that insurance firms use to validate policyholder payment or reimbursement requests.

2.2 Empirical Review

2.2.1 Exchange Rate volatility and Premium Pricing

The intricate relationship between exchange rate volatility and the determination of insurance premium prices is a critical aspect influencing the financial viability of insurers and the accessibility of insurance products to the public. Fluctuations in exchange rates introduces uncertainties that directly impact the cost associated with underwriting risks and subsequently influence the pricing strategies for both life and non-life insurance policies most especially for local insurance firms with considerable foreign policyholders or underwriters.

Rohman, Ronaldo and Siregar (2023), explored the interrelationship between key macroeconomic variables including exchange rate, and insurance gross premiums and claims across a sample of 63 countries categorized into OECD and non-OECD groups between 2010 and 2019. Regression analysis was conducted on the annual panel data, specifically utilizing a fixed effect approach. Both static and dynamic analysis were conducted to access how macroeconomic indicators such as real GDP, inflation, interest rate, and exchange rates influenced gross premiums and claims. The study established negative and significant relationship between exchange rates and insurance gross premium. This implies that as a local currency depreciates against the US Dollar, insurance premiums tend to be suppressed. The study recommended that insurance players should develop robust and comprehensive risk management systems to effectively navigate macroeconomic turbulence.

This study offers a strong global perspective and addresses a notable gap in the literature by simultaneously analyzing both premiums and claims across different income groups, a significant drawback lies it its approach of examining ASEAN economies as a proxy for non-OECD countries, it does not specifically delve into the unique market dynamics or policy nuances of individual countries like Nigeria, which are critical for in-depth understanding. Again, its data period concludes in 2019 which does not capture the volatility arising from COVID-19 and the floatation of Naira in 2023.

Ibe, Ezema, and Okparaka (2023) this study focused on the nature of the impact of exchange rate volatility on insurance market operations in Nigeria. It covered between 1996 and 2022, aiming to understand how exchange rate fluctuations affect total insurance premium, total insurance investment, and total insurance claims within the Nigerian context. Ordinary Least Square (OLS) regression technique at 5% significant level was used. It was complemented through the usage of

ARCH model to confirm the presence of exchange rate volatility. The study found that exchange rate volatility negatively and non-significantly impacted total insurance premium in Nigeria within the study period. Specifically, the regression result showed a coefficient of -0.199 for the log of total insurance premium, with a p-value of 0.3857, indicating it was not statistically significant at the conventional 5% level. The study recommended that insurance companies should intensify efforts to increase insurance penetration to generate more premiums, thereby offsetting the negative effect of exchange rate volatility.

The primary strength of this study lies in its focus on Nigerian insurance market and its inclusion of a very recent dataset (up to 2022), allowing for analysis of current macroeconomic realities like post pandemic effects, however, it still did not capture the post Naira floatation again the presence of inconsistencies in the reporting of findings, particularly regarding the impact on premiums. While the abstract and summary consistently state a negative impact, one “decision” section oddly reports a positive effect for total insurance premium (0.21, 0.03).

2.2.2 Exchange Rate Volatility and Insurance Claims

The impact of exchange rate volatility on insurance claims is a crucial area of this study, as currency fluctuations can significantly alter the costs associated with settling policyholders’ losses, particularly in economies reliant on imported goods or with substantial foreign currency-denominated exposures.

In the study of Rohman, Ronaldo, and Siregar (2023) the result showed that the static estimation results regarding the relationship between macroeconomic indicators and total gross claims showed a negative and insignificant effect. Also, in the study of Ibe, Ezema, and Okparaka (2023) revealed that exchange rate volatility positively (0.21) and significantly (0.03) impacted total insurance claims in Nigeria within the study period. The authors acknowledged that this finding was contrary to theoretical preposition but attributed it to the dynamic nature of the Nigeria financial space as dominated by multiple exchange rates and undefined exchange rates regimes. Our study here extend beyond this’ study period and there is serious convergent of the dual exchange rate regimes with a difference of about N1 as at July 2025.

2.3 Theoretical Framework

A theoretical framework provides the underlying conceptual structure for a research study, guiding the selection of variables and the formulation of hypotheses. It serves as a lens through which phenomena are understood and analyzed, drawing upon established theories to explain relationships between key concepts (Rohman et al., 2023).

Risk-Based Pricing Theory in insurance focuses on determining premiums that accurately reflects the expected value of losses, taking into account the probability and potential severity of future

claims (Ieosanurak et al., 2023; Prabowo et al., 2019). This involves quantifying risk parameters for each policyholder, often through statistical modeling of claim frequency and severity data using methods like Bayesian approach or aggregate claim models (Ieosanurak et a., 2023).

3.0 Research Methodology

As a result of the nature of the time series dataset, in which out of the three variables, exchange rate was found to be stationary at I(3), insurance claim at I(1) and premium pricing at I(2) the dataset was transformed to make them stationary at I(0) and regression analysis based on OLS estimate was employed to analyze the data using E-views version 13.

3.1 Research Design

This study employed ex-post facto approach was used to investigate the impact of exchange rate volatility on insurance claims and premium pricing.

3.2 Sources of Data

The Research data predominantly comprises secondary time series data, including exchange rates, insurance claims, and insurance premium, drawn from official national bodies like the Central Bank of Nigeria (CBN) and National Insurance Commission (NAICOM) as well as the World Bank website.

Standard Deviation of Exchange Rate Changes: A common approach is to calculate the standard deviation of the percentage changes in the daily, monthly, or quarterly exchange rate. For example, monthly exchange rate data (NGN/USD) from the CBN are used to compute the percentage change:

$$\text{Percentage Change} = \frac{\text{ER}_t - \text{ER}_{t-1}}{\text{ER}_{t-1}} \times 100$$

Where: ER_t is the exchange rate at time t. The standard deviation of these changes over a rolling window (e.g., 12 months) represents volatility (Oaikhenan & Aigheyisi, 2015).

3.3 Model Specification

The model specification for investigating the impact of exchange rate volatility on insurance claims and premium pricing often employs econometric approaches such as OLS, panel data regression analysis, Vector Error Correction Models among others. For the purpose of this study, the following combined system of equation model shall be employed.

$$\begin{cases} PP_t = \beta_0 + \beta_1 ERV_t + \varepsilon_t \\ IC_t = \alpha_0 + \alpha_1 ERV_t + \mu_t \end{cases}$$

Where: for model 1,

Effect of Exchange Rate Volatility on Premium Pricing

PP_t: Premium Pricing at time t

ERV_t: Exchange Rate Volatility at time t

β_0: Intercept

β_1: Coefficient measuring the impact of ERV on PP

ε_t : Error term

For model 2,

Effect of Exchange Rate Volatility on Insurance Claims

IC_t: Insurance Claims at time t

ERV_t: Exchange Rate Volatility at time t

α_0: Intercept

α_1: Coefficient measuring the impact of ERV on IC

μ_t : Error term

4.0 Results and Discussion of findings

4.1 stationarity Test Results

All the variables were subjected to stationarity test and it was found that exchange rate, insurance premium, and insurance claim became stationary at I(3), I(2), and I(1) respectively. They were all transformed to achieve stationarity at level.

4.2 exchange Rate Volatility and Insurance Claims

The regression analysis showed an insignificant relationship between exchange rate volatility and insurance claims in Nigeria. The coefficient of exchange rate volatility (D3_EXCH) was – 0.284 (p = 0.744), indicating that exchange rate fluctuations negatively, but insignificantly, influence insurance claims. The R-squared value was 0.019, indicating that only 1.9% of the variation in insurance claims was explained by exchange rate volatility. This is in conformity with the finding of Rohman, Ronaldo, and Siregar (2023) and in contrast with the study of Ibe, Ezema, and Okparaka (2023)

This finding leads to the non-rejection of the null hypothesis which states that there is no significant relationship between exchange rate volatility and insurance claims. The result may reflect the possibility that insurance claims are driven more by domestic exposures or risk events than by macroeconomic shocks such as exchange rate volatility. It further revealed that Nigerian insurance market is largely dominated by local policyholders who pay premiums and receive claims in local currency.

In order to validate the robustness and reliability of the regression model, several diagnostic tests were conducted and the results are presented as follows: Durbin-Watson (DW = 1.82), this values

falls within the acceptable range of 1.5 to 2.0 which suggests that there is absence of first-order autocorrelation. The correlogram and LM ($p > 0.05$) test values were all greater than the p value of 0.05 confirm the absence of serial correlation in the residuals. The virtual inspection of the histogram normality test indicates approximately normal distribution of residuals. To further confirm this, we observed the Jarque-Bera and probability values of the test which showed 5.05 and 0.08 respectively, and they are both greater than value the alpha value of 0.05, hence a normally distributed residuals is achieved. Breusch-Pagan-Godfrey Test of $p = 0.853$ confirms the absence of heteroskedasticity, affirming homoscedastic residuals. Ramsey RESET Test of p-value = 0.881 shows that the model is correctly specified without omitted nonlinear terms. The CUSUM Test conducted indicates model stability over time, indicating reliable coefficient behavior as the blue line is in between the two red boundary lines.

Overall, the model passes all major diagnostic checks, though the main variable remains statistically insignificant. This implies that while the model is economically sound, exchange rate volatility may no play a central role in determining aggregate insurance clams.

4.4 Exchange Rate Volatility and Insurance Premium Pricing

This regression result shows that exchange rate volatility has a negative and marginally significant relationship with insurance premium pricing. The coefficient for D3_EXCH was -0.964 ($p = 0.089$), with an R-squared of 0.405. This indicates that about 40.5% of the variation in insurance premium pricing could be explained by exchange rate fluctuations. Though not statistically significant at the conventional 5% level, the p-value close to 0.05 suggests that exchange rate volatility may be relevant determinant of insurance pricing behavior in Nigeria. We still do not have enough statistical evidence to reject the null hypothesis. This is similar to the work of Rohman, Ronaldo, and Siregar (2023) who also reported negative but significant relationship between the variables, but completely in line with the findings of Ibe, Ezema, and Okparaka (2023).

The diagnostic result for this model is given as follows; Durbin-Watson ($DW = 2.46$) indicates absence of autocorrelation. Correlogram and LM Test with p-values of 0.094 shows no evidence of serial correlation, however, the value approaches borderline significance. The model also shows evidence of homoscedastic residuals with no concern for variance instability as the Heteroskedasticity test has a p-value of 0.448. The Ramsey RESET test has a p-value of 0.0289 which is statistically significant indicates the possibility of model mis-specification. CUSUM test suggests that the model remained stable over the sample period.

The RESET result again hints at a model specification problem. While the exchange rate coefficient approaches significance, it is possible that nonlinear effects or omitted variables (such as inflation or regulatory changes) could enhance the explanatory power of the model.

5.0 Conclusion and Recommendation

Across the two models, the empirical results consistently indicate a negative relationship between exchange rate volatility and key insurance indicators in Nigeria. However, in the case of insurance premium pricing is the relationship approaching significance. Diagnostic checks largely support model reliability, with residuals normality, homoscedasticity, and serial independence generally confirmed. However, the Ramsey RESET test highlights the need for further model refinement, particularly through the inclusion of omitted variables or nonlinear transformations.

These findings underscore the complexity of the insurance sector's response to macroeconomic volatility. While exchange rate instability may intuitively affect premium pricing and insurance claim, the empirical evidence from this dataset remains inconclusive, possibly due to small sample size or model specification limitations. The study therefore recommended that wider sample should be used as well as additional predictor variables in the future studies.

References

Abdul Jabbar, A., Geraldine, E., Muthoifin, M., & Afiyah, I. (2024). The importance of insurance in reducing systematic risk and aiding poverty alleviation: A review of financial protection. *Solo International Collaboration and Publication of Social Sciences and Humanities, 2*(01), 37–46. https://doi.org/10.61455/sicopus.v2i01.118

Adefulu, A., & Banmore, O. (2023). Claims management practices and firm profitability of listed insurance companies in Nigeria. *International Journal of Advanced Studies in Economics and Public Sector Management.* https://www.semanticscholar.org/paper/CLAIMS-MANAGEMENT-PRACTICES-AND-FIRM-PROFITABILITY-Adefulu-Banmore/60bb9962a1a571c6bc3d1eb6b8c14fdacdbeb127

Agusto & Co. (2024). *2024 insurance industry report.* https://www.agustoresearch.com/report/2024-insurance-industry-report/

Aigheyisi, O. (2021). Factors explaining exchange rate volatility in Nigeria: Theory and empirical evidence. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.3842230

Dragotă, I. M., Cepoi, C. O., & Ştefan, L. (2023). Threshold effect for the life insurance industry: Evidence from OECD countries. *The Geneva Papers on Risk and Insurance - Issues and Practice, 48,* 799–820.

Edem, U. A., Akeem, S. O., Okeyemi, M. O., David, O. O., & Mayowa, A. I. (2022). Volatility of exchange rate in Nigeria: An investigation of risk on investment. *Asian Journal of Probability and Statistics,* 22–29. https://doi.org/10.9734/ajpas/2022/v17i430429

Etim, N. A., et al. (2023). Exchange rate volatility and insurance sector performance in Nigeria. [Details not fully specified].

Fortune, P. (1973). A theory of optimal life insurance: Development and test. *The Journal of Finance, 28*(3), 587–600.

GlobalData. (2024). *Nigeria insurance industry – Governance, risk and compliance.* https://www.globaldata.com/store/report/nigeria-insurance-industry-government-regulation-analysis/

Goswami, K. (2025). Impact of claims paid and customer complaints on new business acquisition of life insurance companies: A theoretical and empirical analysis. *ProQuest.* https://www.proquest.com/docview/3225883005?fromopenview=true&pq-origsite=gscholar&sourcetype=Scholarly%20Journals

Hosseinzadeh, M., & Daei-Karimzadeh, S. (2017). Investigate the effect of exchange rate volatility on demand for life insurance in Iran. *International Journal of Economics and Financial Issues, 7*(2), 166–174.

Hussain, M., Bashir, U., & Rehman, R. U. (2023). Exchange rate and stock prices volatility connectedness and spillover during pandemic-induced crises: Evidence from BRICS countries. *Asia-Pacific Financial Markets, 31,* 183–203.

Ibe, J., Ezema, C. A., & Okparaka, V. C. (2023). Exchange rate volatility and insurance market operations: Implications in Nigeria, 1996–2022. *Global Research Journal of Accounting and Finance, 4*(2), 127–148.

Ieosanurak, W., Khomkham, B., & Moumeesri, A. (2023). Claim modeling and insurance premium pricing under a bonus–malus system in motor insurance. *International Journal of Applied Mathematics and Computer Science, 33*(4), 637–650. https://doi.org/10.34768/amcs-2023-0045

Ipigansi, P., & Egoro, A. S. (2022). Effect of exchange rate on insurance industry claims settlement in Nigeria. *Journal of Economics, Management & Social Science, 8*(2). https://www.researchgate.net/publication/370592470_EFFECT_OF_EXCHANGE_RATE_ON_INSURANCE_INDUSTRY_CLAIMS_SETTLEMENT_IN_NIGERIA

Kartikasari, M. D. (2016). Premium pricing of liability insurance using random sum model. *Eksakta: Jurnal Ilmu-Ilmu MIPA, 16*(2), 77–83.

Kolapo, F. T., Oluwaleye, T. O., & Osasona, A. V. (2022). Determinants of insurance sector development in Nigeria. *Account and Financial Management Journal, 7*(03), 2672–2685.

Leadway Assurance. (2022). 12 insurance statistics in Nigeria you should know [Infographic]. https://www.leadway.com/insurance-nigeria-statistics/

Mandeij, D. (2020). Determination of equilibrium exchange rate Rupiah against US Dollar and its volatility: Application of asset approach. *International Journal of Business and Administrative Studies, 6*(6). https://doi.org/10.20469/ijbas.6.10004-6

Moriah, M., Vermet, F., & Charpentier, A. (2023). Measuring and mitigating biases in motor insurance pricing. *arXiv*. https://doi.org/10.48550/ARXIV.2311.11900

Moumeesri, A., & Pongsart, T. (2022). Bonus-malus premiums based on claim frequency and the size of claims. *Risks, 10*(9), 181. https://doi.org/10.3390/risks10090181

NAICOM. (2023). *Bulletin of the insurance market performance Q4 2023.* https://storage.naicom.website/naicom/files/BULLETIN%20OF%20THE%20INSURANCE%20MARKET%20PERFORMANCE%20Q4%202023.pdf

Oaikhenan, H. E., & Aigheyisi, O. S. (2015). Factors explaining exchange rate volatility in Nigeria: Theory and empirical evidence. *CBN Economic and Financial Review, 53*(2), 39–66. https://dc.cbn.gov.ng/efr/vol53/iss2/3/

Offiong, A. I., James, G. B., Etim, G. S., Enuoh, R. O., Bessong, P. K., & Omang, A. B. (2020). Exchange rate volatility and insurance sector performance in Nigeria: A long-run investigation. *Academy of Accounting and Financial Studies Journal, 24*(3), 1–28.

Olamide, E., Ogujiuba, K., & Maredza, A. (2022). Exchange rate volatility, inflation and economic growth in developing countries: Panel data approach for SADC. *Economies, 10*(3), 67. https://doi.org/10.3390/economies10030067

Olamide, O., Oladunni, O., & Okonkwo, I. V. (2022). Impact of risk retention on claims management of insurance companies in Nigeria. [Details not fully specified].

Olarewaju, O. D., & Msomi, S. S. (2021). The determinants of life insurance consumption in South Africa. *Cogent Economics & Finance, 9*(1), 1952402.

Orisdare, M. A., & Olofin, S. (2024). Exchange rate volatility and productivity in Nigeria: An empirical analysis. *Asian Journal of Economics, Business and Accounting, 24*(6), 1–12. https://doi.org/10.9734/ajeba/2024/v24i61357

Panchal, S., & Rao, P. N. (2024). Corporate social responsibility in insurance sector and the role of insurance sector in economic development of India. *Journal of Economics, Innovative Management and Entrepreneurship.* https://www.semanticscholar.org/paper/Corporate-Social-responsibility-in-Insurance-sector-Panchal-Rao/1ed463bc62c4cad35998af64ea1414930e2f991c

Prabowo, A., Mamat, M., Sukono, S., & Taufiq, A. A. (2019). Pricing of premium for automobile insurance using Bayesian method. *International Journal of Engineering & Technology, 8*(3.1.2), 177–180.

Raifu, I. A., & Farayibi, A. O. (2022). Effect of exchange rate volatility on financial sector development: Evidence from Nigeria and South Africa. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.4221813

Raji, O. A., & Adejuwon, E. O. (2021). Effect of exchange rate volatility on the performance of insurance sector in Nigeria. *Journal of Business and Organizational Development, 13*(2), 63–79. https://www.cenresinjournals.com/wp-content/uploads/2022/02/Pages-63-79-2021-13051.pdf

Rohman, I. K., Ronaldo, R., & Siregar, R. Y. (2023). Interrelationship between macroeconomic variables with insurance premiums and claims: A panel data analysis of ASEAN-5

countries. *Journal of ASEAN Studies, 11*(2), 1–20. https://doi.org/10.21512/jas.v11i2.10214

Simionescu, M., & Ulbinaitė, A. (2021). The relationship between insurance market and macroeconomic indicators in the Baltic states. *Journal of Baltic Studies.* https://www.semanticscholar.org/paper/The-relationship-between-insurance-market-and-in-Simionescu-Ulbinait%C4%97/6ddaff2c6f97160111bbfcf9bc89134f2ef8989a

Singhal, A., Pushkarna, V., Tripathi, M., & Rana, N. (2020). Insurance–growth nexus: Empirical evidence from emerging Asian markets. *Transnational Corporations Review, 12*(3), 238–252. https://doi.org/10.1080/19186444.2020.1756170

vanguardngr. (2019, December 18). Nigerian insurance industry ranks 62nd in the world. *Vanguard Newspaper.* https://www.vanguardngr.com/2019/12/nigerian-insurance-industry-ranks-62nd-in-the-world/

Zarnowitz, V. (1992). *Business cycles: Theory, history, indicators, and forecasting.* University of Chicago Press.

Zerriaa, M., & Noubbigh, H. (2016). Determinants of life insurance demand in the MENA region. *The Geneva Papers on Risk and Insurance - Issues and Practice, 41,* 491–511